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P. A. VAN DER BYL: Suid - Afrikaanse
Lentinus-Soorte.

LEN VERWOERD: Peronospora Mesem-
bryanthemi, n.sp., die oorsaak van 'n Donsige
Skimmelsiekte van Mesembryanthemum-soorte.

PRYS 1s.

NASIONALE PERS, BEPERK, KAAPSTAD

Elke bydrae wat gedruk word verskyn as 'n afsonderlike aflewering, uitgenome in spesiale gevalle.

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Die skrywers ontvang gratis 50 eksemplare van hulle bydraes.

Stukke vir opname en korrespondensie word geadresseer aan DR. W. BLOMMAERT, Uniwersiteit, Stellenbosch.

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Suid-Afrikaanse *Lentinus*-Soorte

DEUR

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(A summary in English is given at the end of the article.)

INLEIDING.

In 'n vorige aflewering van hierdie *Annale** het ek die Suid-Afrikaanse geslagte en soorte van 'n paar fungus-famielies beskryf.

My doel is om sover moontlik die verskillende fungusse of swamme wat in Afrika voorkom sistematies te bestudeer, in die hoop dat dit dan later moontlik sal wees om 'n „Suid-Afrikaanse Fungus-Flora” te publiseer.

In hierdie artikel behandel ek die Suid-Afrikaanse soorte van die geslag *Lentinus*.

Die geslag *Lentinus* behoort tot die famielie *Agaricaceae*, die sogenaamde „plaat-fungusse.” Die kenmerkende eienskap van hierdie famielie is dat die fungusse wat daartoe behoort, hul spore of voortplantingskieme aan die oppervlakte van plate (lamelles) dra. Ander bekende fungusse van die famielie is die eetbare „sampioen” en die sogenoemde „duiwelskos.”

Die vrugliggame van *Lentinus* bestaan tiepies uit 'n steel (stipes) wat 'n hoed (pileus) dra. Aan die onderkant van die hoed is daar 'n aantal plate (lamelles) wat uitloop van die sentrum na die omtrek van die hoed, en op hierdie plate dra die fungusse hul spore.

Die geslag *Lentinus* word van die ander geslagte van die famielie *Agaricaceae* onderskei veral deurdat sy vrugliggame nie vleserig is nie, maar *inteendeel taai, en min of meer leeragtig en buigsaam, as hul vars of nat is*. Sy spore is kleurloos, en die rande van die plate is of heel of saagvormig of tandvormig opgebreek of gekerf.

* Jaargang 1, Reeks A, Afl. 3 (Sept. 1923).

Sommige outeurs skei die geslag *Panus* van die geslag *Lentinus*, en in die eerste geslag plaas hul dan die soorte wat getande of gekerfde plate het en in die laaste dié met heel plate.

Waar ek maar met 'n beperkte omgewing en 'n klein getal soorte te doen het, beskou ek dit wenslik om al die „plaat-fungusse,” met wit spore, en taai leeragtige vrugliggame in die geslag *Lentinus* te plaas, heeltemal afgesien van hoe die rande van hul plate mag wees. By *Lentinus* sluit ek dus *Panus* in.

Lentinus-soorte kom veral voor in die meer tropiese dele, en hul groei op dooie stompe en stamme. Ons kry hul veral in bosse, b.v. in die inheemse bosse van Knysna, Soeloeland en ander dele. Hul kom feitlik in al die verskillende lande voor; en die meeste soorte wat in Afrika voorkom word ook elders gekry.

Ek is dank verskuldig aan dr. Peringuey, Direkteur van die Suid-Afrikaanse Museum, Kaapstad, wat so goed was om die eksemplare in die Herbarium van die Museum tot my beskikking te stel.

Die nommers tussen hakies, in die beskrywings wat volg, is die nommers van die fungusse in my versameling.

SLEUTEL TOT DIE SOORTE.

Oppervlakte van hoed kaal:

Rand van hoed heel of effens gelob.

1. *L. sajor-caju*.

Rand van hoed diep gelob.

2. *L. Woodii*.

Oppervlakte van hoed skubbig.

3. *L. lepideus*.

Oppervlakte van hoed harig:

Oppervlakte straalvormig gestreep en
later word die hoed gesplits.

4. *L. natalensis*.

Hoed word nie gesplits nie:

Hare op oppervlakte dig en baie ru:

Rand van plate getand.

5. *L. cirrosus*.

Rand van plate heel.

6. *L. fastuosus*.

Hare op oppervlakte minder dig en
minder ru:

Rand van plate heel.

7. *L. velutinus*.

Rand van plate getand.

8. *L. lecomtei*.

BESKRYWINGS VAN DIE SOORTE.

1. *Lentinus sajor-caju*, Fr. Ep., bl. 393. (Fig. 1.)

Vrugliggaam met 'n steel en groei op hout. HOED tregtervormig, leeragtig, buigsaam, 6—11 cm. diam x 2—7 mm. dik; oppervlakte room- tot okerkleurig, soms meer grys, veral onder in die tregter, dikwels met donkerbruin vlekke, skurfagtig of kaal, somtyds straalvormig gestreep; rand teruggebuie, heel of effens ingesny of gelob; vlees 5 mm. of minder dik. PLATE loop langs die steel af, eers wit en later okerkleurig, dig op mekaar, 1—4 mm. breed, hul sye bedek met regopstaande projeksies, wat opgebou is uit inmekaar-gevegte fungus-drade, en $4\ \mu$ of meer hoog is x $35\ \mu$ diam. STEEL kaal, en in die lengte gestreep, 5—15 cm. lank x 5—1 cm. diam; onder, waar hy vas is, is hy skildvormig verbreed; om die steel is daar dikwels die oorblyfsels van 'n ringvlies.

Op ou dooie stompe, Durban (303); Soeloeland (513); Knysna (755).

Wood se No. 391, wat in Durban gekollekteer was, en as *L. dactilophorus* Lev. identifiseer is, is ongetwyfeld *L. sajor-caju*.

L. Murrayii, K. en MacOw. (Grev. IX, 136) is van Oos-Londen beskryf. Ek het ongelukkig nie egte eksemplare of duplikate van hom gesien nie, maar hy is ongetwyfeld baie na aan *L. sajor-caju* en in die oorspronklike beskrywing word dit gesê dat hy verskil deurdat sy hoed nie gestreep is nie.

2. *Lentinus Woodii*, Kalch, Grev. IX, bl. 136.

Vrugliggaam met 'n steel en groei op hout. HOED 7 cm. diam., leeragtig, dun, straalvormig gestreep, kaal, roomkleurig; rand onreëlmatig gelob. PLATE lank, en loop langs die steel af, dig op mekaar en met heel rande. STEEL eksentries of meer bepaald aan die sy, 25 cm. lank x 8 cm. diam.

Op hout, Inanda, Natal, Wood No. 115; eksemplare in Herb. Suid-Afr. Museum, Kaapstad.

Hierdie soort is onderskeidbaar aan sy gelobde rand. Met uitsondering van sy eienaardige rand, is hy na aan *L. sajor-caju*. Hoewel ek *L. sajor-caju* dikwels gekollekteer het, het ek nooit eksemplare met sulke diep gelobde rande gevind nie.

Hierdie fungus is net eenmaal gekollekteer geword; en meer kolleksies is nodig om te besluit of hy werklik 'n aparte soort is, of maar 'n variasie van *L. sajor-caju*.

3. *Lentinus lepideus*, Fr. Ep., bl. 390 Hym. Europ., bl. 481.
(Fig. 2 en 3.)

Vrugliggaam met 'n steel en groei op denne-stompe. HOED 6—18 cm. diam., stewig, taai, reëlmatig of onreëlmatig, plat of ingesink oor die steel, soms bepaald tregtervormig; oppervlakte liggeel tot okerkleurig, en *breek op in donkerder skubbe*; rand soms gelob of diep ingesplits; vlees wit, buigsaam as die vrugliggaam nat is, maar hard wanneer hy droog is, 2—1.5 cm. dik. PLATE loop min of meer langs die steel af, agter by die steel is hul ingeknip, 5—1.5 cm. breed, hul is dwars gestreep, en hul rande word vroeg onreëlmatig getand; as die vrugliggaam jonk is, strek daar 'n dun vlies (ringvlies) van die steel na die omtrek van die hoed en bedek so die plate. STEEL sentraal, eksentries, of lateraal, 4—5 cm. lank x 2—3 cm. diam., stewig, hard, verdun na onder, oppervlakte skubbig. SPORE kleurloos, glad, ellipties, 8—10 x 4—5 μ .

Op ou denne-stompe (Pinus), Klapmuts, dist. Paarl (651 en 909).

Hierdie soort is gemaklik herkenbaar aan sy skubbige oppervlakte. Die vrugliggame groei soms in kloppe dig op mekaar.

4. *Lentinus natalensis*, n.sp.* (Fig. 4.)

Vrugliggaam met 'n steel en groei op hout. HOED dun, leeragtig, buigsaam as hy nat is, en bros as hy droog is, tregtervormig, 5—6 cm. diam; oppervlakte rooibruin (terra cotta), bedek met verspreide bundels van ru, donker gekleurde hare, *gestreep van die sentrum na die omtrek en later splits die hoed*; rand dun, teruggebuie, en met soortgelike hare bedek. PLATE loop langs die steel af, bleek van kleur, dig op mekaar, 1 mm. of minder breed, met heel rande. STEEL 1.5 cm. lank x 3—4 mm. diam., behaar, min of meer ferweelagtig, rooibruin.

Op dooie stomp, Winkelspruit, Natal (648).

* *Lentinus natalensis*, n.sp.

Pileo tenui, coriaceo, infundibuliformi, striato, demum fisso, 5—6 cm. lat., fasciculato-hispido, badio; margine tenui, incurvo, fasciculato-hispido, lamellis pallidis, angustis, confertis, decurrentibus; acie integris; stipite 1.5 cm. long. x 3—4 cm. cr., velutino-hispido.

L. velutino affinis sed differt tamen in colore, et in pileo striato et demum fisso.

Hierdie soort is van *L. velutinus* onderskeibaar veral aan sy gestreepte hoed wat later splits, verder is sy kleur anders en is hy nie so dig behaar nie. By gedroogde eksimplare is die oppervlakte van die hoed effens gevoor.

5. *Lentinus cirrosus*, Fr. Afz. F. Guin, t.x, fig. 21. (Fig. 5.)

Vrugliggaam met 'n steel, groei op hout en soms dig op mekaar. HOED leeragtig, taai, buigsaam, in die middel nawelvormig ingedruk, 3—5 cm. diam.; oppervlakte bedek met bundels van donkerbruin tot swart hare, wat ru en veselagtig is; rand teruggebuie, en dig bedek met hare. PLATE loop langs die steel af, dig op mekaar, 2—4 tot die mm., 2 mm. breed; hul sye is bedek met bundels van regopstaande fungus-drade (hiefes), wat 19—26 μ in diam. is en 37—55 μ hoog; hul rande breek al vroeg saagvormig op. STEEL 2—3 cm. lank x 5—8 mm. diam., eers bedek met bundels van donkerbruin hare, later skurfagtig tot amper kaal en glad; die oorblyfsels van 'n ringvlies is soms aan die steel sigbaar.

Op dooie stompe en takke, Durban (155); Pietermaritzburg (153); Howick (331); Eshowe (515).

Herkenbaar aan sy donker kleur, so te sê swart, en lang, ru hare.

L. stuppeus, Kl. (Linnea 1833, bl. 480) is ongetwyfeld dieselfde fungus. Ek is van mening dat „*cirrosus*” die ouer naam is en behou hom dus.

6. *Lentinus fastuosus*, K. en MacOw., Grev. IX, bl. 135.

Vrugliggaam met 'n steel en groei op hout. HOED tregtervormig, 4—6 cm. diam.; oppervlakte dig bedek met bundels van ru, regopstaande, donkerrooi hare; rand teruggebuie, harig, PLATE loop langs die steel af, dig op mekaar en met heel rande. STEEL 4—7 cm. lank x 5 mm. diam., harig, ferweelagtig.

Op dooie hout, Somerset-Oos, Fung. MacOw., Nos. 1233 en 1235, eksimplare in Herb. Suid-Afr. Museum, Kaapstad.

Onderskeibaar van *L. velutinus* aan sy meer harige oppervlakte. Die hare is ook ruer en donkerrooi. Gemaklik van *L. cirrosus* onderskeibaar aan die heel rande van sy plate.

7. *Lentinus velutinus*, Fr. Linnea 1830, bl. 510. (Fig. 6.)

Vrugliggaam met 'n steel en groei op hout.. HOED dun, leeragtig, tregtervormig of met 'n sentrale nawelvormige indruk, 2·5—3 cm. diam.; vlees dun; oppervlakte ligkaneelkleurig tot bruin, bedek met ferweelagtige of meer ru hare; rand teruggebuie en met langer hare. PLATE loop langs die steel af, dig op mekaar, 3—5 tot die mm., 2 mm. of minder breed; hul sye is sonder hiefes-gewasse en hul rande is heel. STEEL 1·7—2·5 cm. lank x 3—4 mm. diam., dig bedek met ferweelagtige hare.

Op ou stompe en takke, Pietermaritzburg (154); Schroeders (334); Durban (335 en 338).

Die enigste verskil tussen *L. velutinus* en *L. fasciatus*, Berk. (H.K. Jnl. 1840, bl. 148) skyn te wees dat die hare van laasgenoemde langer is. Dit is egter skaars genoeg verskil vir 'n aparte soort en laasgenoemde word dus teenswoordig beskou as maar 'n vorm van eersgenoemde, met buitengewoon lange hare.

8. *Lentinus lecomtei*, Fr. Ep., bl. 368. (Fig. 7.)

Vrugliggaam met 'n steel en groei op hout, dikwels in klompe en met hul stele onder aan mekaar vergroei. HOED 2—4 cm. diam., leeragtig as hy nat is en bros as hy droog is; oppervlakte plat en met 'n nawelvormige indruk bo die steel, soms meer bepaald tregtervormig, bedek met bundels van ru, regopstaande, bruin hare, soms amper kaal en meer vaal van kleur; rand teruggebuie, soms gelob, ook met hare bedek; vlees wit, 5—1 mm. dik. PLATE loop langs die steel af, dig op mekaar, 2—3 mm. breed; hul sye is bedek met bundels van regopstaande fungusdradé (hiefes); *hule rande is getand*. STEEL 5—6 cm. lank x 3—8 mm. diam., sentraal of eksentries. SPORE (volgens Petch) ovaal, effentjies geel, 6—7 x 3 μ .

Op gebrande hout, Knysna, mej. A. V. Duthie 54 (1087, 1304). Fung. MacOw., Nos. 1043 en 1045, gekollekteer by Boschberg en bewaar in Herb. Suid-Afr. Museum, Kaapstad.

Dit is die algemeenste *Lentinus* op gebrande hout in die Knysna-bosse.

Nota.—Ongelukkig is eksemplare van sommige *Lentinus*-soorte, wat in die vroeë dae in Suid-Afrika gekollekteer was, nie in enige instituut in die land bewaar geword nie. Ek kon hul

dus nie bestudeer nie maar gee hul name en die plek waar hul gekry was :

L. hyracinus, Kalch, Grev. IX, bl. 136. Gekollekteer in Somerset-Oos deur MacOwan.

L. miserculus, Kalch, Grev. IX, bl. 136. Gekollekteer in Somerset-Oos deur MacOwan.

L. Murrayii, Kalch en MacOwan, Grev. IX, bl. 136. Gekollekteer deur Murray in Oos-Londen.

L. Zeyheri, Berk, Lond., Jnl. Bot. Gekollekteer in Natal deur Wood en by Boschberg deur MacOwan.

ENGLISH SUMMARY.

The paper deals with the South African species of the genus *Lentinus*. Descriptions are given of the following species :

L. cirrosus, Fr.

L. natalensis, n.sp.

L. fastuosus, Kalch en MacOw.

L. sajor-caju, Fr.

L. lecomtei, Fr.

L. velutinus, Fr.

L. lepideus, Fr.

L. Woodii, Kalch.

The undermentioned species, also recorded from South Africa, have not been collected recently. Duplicates or types of them are unfortunately not preserved at any South African institution, and they were hence not available for study :

L. hyracinus, Kalch.

L. Murrayii, Kalch and MacOw.

L. miserculus, Kalch.

L. Zeyheri, Berk.

VERKLARENDE AANTEKENINGE BY DIE
ILLUSTRASIES.

- Fig. 1. Foto van *L. sajor-caju*, Fr.
- Fig. 2. Foto van *L. lepideus*, Fr. Boonste oppervlakte van 'n hoed. Let op die skubbe wat eienaardig is van hierdie soort.
- Fig. 3. Foto van *L. lepideus*, Fr. Onderkant van 'n hoed. Let op die getande plate.
- Fig. 4. Foto van *L. natalensis*, n.sp.
- Fig. 5. Foto van *L. cirrosus*, Fr. Let op die ru, veselagtige hare.
- Fig. 6. Foto van *L. velulinus*, Fr.
- Fig. 7. Foto van *L. lecomtei*, Fr.



Fig 1.



Fig 2

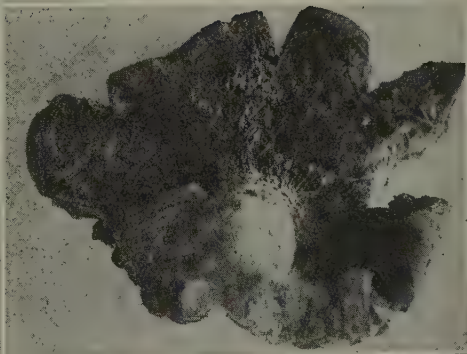


Fig 3

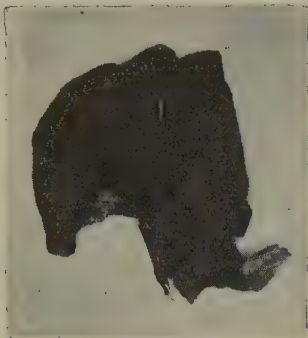


Fig 4

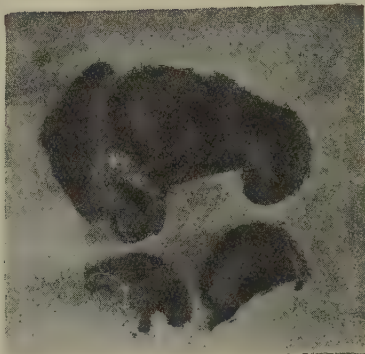


Fig 5

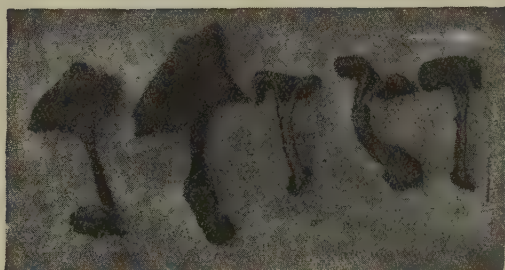


Fig 6

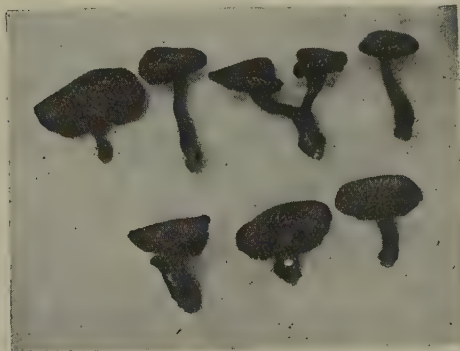


Fig 7

Peronospora mesembryanthemi, n.sp., die oorsaak van 'n Donsige Skimmelsiekte van Mesembryanthemum-soorte

DEUR

LEN. VERWOERD.

Mededeling van die Laboratorium vir Swamkunde en Plantesiekte-kunde van die Uniwersiteit van Stellenbosch.

(A summary in English is given at the end of the article.)

INLEIDING.

In Augustus 1923 het prof. P. A. van der Byl my aandag op die siekte bepaal wat in hierdie artikel beskryf word. Dis vir die eerste maal deur hom aangetref op verskeie Mesembryanthemum-soorte (in Suid-Afrika bekend onder die populêre term „vygies”) in sy kliptuin, waar dit die dood van die plante veroorsaak het.

Aangesien daar 'n steeds toenemende belang in die wilde plante van die land gestel word, en verskeie persone hul daarop toelê om vygies of Mesembryanthemums aan te kweek, is dit waarskynlik dat die siekte alreeds op ander plekke voorkom, of later sal voorkom, en dat die liefhebber van vygies sy aandag aan die siekte sal moet gee om sy vygies te behou.

Ek is dank verskuldig aan prof. Van der Byl dat hy die siekte onder my aandag gebring het, asook vir hulp en advies my verleen by die ondersoek daarvan.

DIE SIEKTE.

Distribusie.

Sover as kan uitgemaak word, is hierdie siekte nog nie aangeteken nie, en is dit ons dus onbekend of hy nie miskien al lank en onopgemerk die vernietiging van vygie-plantjies veroorsaak nie.

Die siekte het eers voorgekom op vyf onbepaalde soorte van *Mesembryanthemums* aan die suidekant van 'n kliptuin in Stellenbosch. Daarna het ek dit ook gekry op die plaas Welgevallen, naby die dorp. Mevr. F. Bolus, van Kaapstad, het my meege-deel dat sy tot dusver die siekte nog nie in die botaniese tuine, Kirstenbosch, opgemerk het nie.

Simptome.

Die eerste kenteken van die siekte is die teenwoordigheid van klein, wit, donsige vlekkes op die blare en ook op die blom-bodem, kelkblare, blomsteel en die jongere stammetjies. Die vlekkes sprei hul veral op die blare gou uit; en dan lyk dit asof die blare met 'n wit, donsige gewas bedek is. (Fig. 1.) Mettertyd word die aangetaste blare geel van hulle punte af, droog dan heeltemal uit, en val af. Die plant het dan die dooie voorkome van blaarloose en verdroogde takkies. (Fig. 2.)

Skadelikheid.

Die siekte is buitengewoon vernielsugtig; en as die kondiesies gunstig is, dan versprei dit maklik van een deel van 'n plant na 'n ander, en binne 'n paar weke is die hele plant blaarloos en uitgedroog, soos bo beskryf. Ander, meer sekondêre swamme, kom ook op besmette plante voor en dra verder by tot die vernietiging van die plant. By 'n later geleentheid hoop ek om sommige van dié sekondêre swamme meer volledig te bestudeer.

Kondiesies gunstig vir die siekte.

By die eerste kliptuin waar die siekte sy verskyning gemaak het, het ek opgemerk dat dit voorgekom het by vygies wat aan die suidekant van die kliptuin en dus gedeeltelik in die skaduwee gestaan het. Die vygies aan die ooste kant was nie besmet nie. Aangesien daar verskillende soorte vygies in die kliptuin was, mag dit natuurlik ook wees dat almal op die oostekant meer bestand teen die siekte is. Aan die suidekant was daar ook sommige soorte wat die siekte nie gekry het nie.

By 'n later geleentheid, veral as ek meer van die distribusie van die siekte weet, hoop ek om met behoorlik gekontroleerde infeksie-proewe na te gaan watter vygie-soorte erg vatbaar is vir die siekte, watter soorte minder daarvoor vatbaar is, en watter

daarteen bestand is. Uit my voorlopige waarnemings blyk dit wel dat daar soorte is wat die siekte nie kry nie.

Op die tweede plek in Stellenbosch, waar ek die siekte gekry het, was dit op 'n vygie wat aan die suidekant van 'n heuwel, en gedeeltelik in die skaduwee, wild in die veld gestaan het.

Verder kan ek konstateer dat die siekte verval vinnig toeneem gedurende nat weer. Nat weer, veral as dit gepaard gaan met 'n temperatuur wat nie te laag is nie, is besonder gunstig vir die verspreiding en ontwikkeling van die swam. Die donsigheid op die blare wys veral goed 'n paar dae ná 'n reën.

Veroorsakende organisme.

Die swam wat hierdie donsige skimmel op die Mesembryanthemum-soorte veroorsaak, behoort aan die geslag *Peronospora* van die famielie *Peronosporaceae* en word verder in hierdie artikel volledig bskryf.

MIKROSKOPIESE BOU VAN DIE SWAM.

Die miselium.

Die miselium is $1.7-3.4 \mu$ in diameter, het 'n kleurlose inhoud en is sonder dwarsmure. Die miselium is taamlik, vertak en beperk tot die lugruimtes tussen die selle, waarin dit knopvormige houstoria's (of houstorieë) uitgee. (Fig. 3 f.) Die houstoria's het 'n diameter van 8μ . Van die miselium ontstaan die konidiofore, wat deur die huidmondjies te voorskyn tree. (Fig. 3 d).

Die konidiofore of konidieëdraers.

Die konidiofore, wat baie vertak is, kom enkel te voorskyn aan die aangetaste dele. As die konidiofore volkome gevorm is, bestaan hulle hoofsaaklik uit 'n hoofas, waaraan 3—4 sy-takke ontstaan, wat weer vertak. Die ent-takkies of sterigmes (Fig. 3 e) het 'n lengte van $6.8-11.2 \mu$ en 'n dikte van $2.8-3.2 \mu$. Konidiofore ontstaan op die jonger sappige deel van die stammetjie, blomsteel, blom bodem en kelkbare maar veral op die blare.

Die konidiofore het 'n kleurlose protoplasmatiese inhoud, het geen dwarsmuur nie, en varieer in grootte van $64.6-105.4 \mu \times 6.8-11.2 \mu$. Die ent-takkies of sterigmes is altyd in twee gedeel

en hul punte is afgerond. Die sterigmes is $6.8-11.2 \mu \times 2.8-3.4 \mu$, hoewel 'n paar aangetref is van $6.8-17.0 \mu$. Waar die koniediofore uit die huidmondjies verskyn, is hulle $6.8-11.2 \mu$ in diameter.

Die koniediums of koniedieë.

Die koniediums, wat in die loop van die studie aangetref is, was altyd aan die ent van die sterigmes. Hulle is ovaal tot langwerpigerond met 'n grootte van $27.2-34 \mu \times 17.0-20.4 \mu$. Verder is hulle kleurloos en het 'n fyn, korrelagtige inhoud; en as hulle ouer word, ontstaan daar meestal een groot, sentrale vakuool in hulle. Die buitemuur van die koniediums is betreklik dik, terwyl die binnemuur dun is.

Rosenbaum* merk op dat die grootte van die koniediums van een en dieselfde *Phytophthora*-soort baie varieer en dat dit dus moeilik is om die grootte van die koniediums van verskillende soorte met mekaar te vergelyk. Hy het verder gevind dat vir vergelykingsdoeleindes die verhouding van lengte tot breedte van die koniediums meer vertroubare resultate gee. Die variasie in die grootte van die koniediums is by ons swam so klein dat ek dit amper onnodig ag om die verhouding van hul lengtes tot hul breedtes aan te gee.

Die volgende tabel gee die groottes aan van 'n aantal koniediums:—

Lengte:	Breedte.	Verhouding l: b.
27.2 μ	21.4 μ	1.3
23.8	17.0	1.4
27.2	21.4	1.3
27.2	17.0	1.6
30.6	17.0	1.8
27.2	21.4	1.3
34.0	21.4	1.6
30.6	17.0	1.8
30.6	17.0	1.8
34.0	21.4	1.6
27.2	17.0	1.6
23.8	21.4	1.6

* Rosenbaum, J. Studies of the Genus *Phytophthora*. *Journal of Agric. Research*, Vol. VII, No. 7, pp. 233—276 (1917).

Oöspore.

Ten spyte van sorgvuldig seek is geen oöspore of ander rustende spore gekry nie.

Ontkieming van die koniediums.

Die koniediums ontkiem gemaklik in reënwater binne 24 uur by kamer-temperatuur. In gewone kraanwater het die koniediums baie sleg ontkiem. Voor ontkieming word die koniediums enig-sins meer langwerpig en ontstaan daar ook in hulle 'n betreklik groot vakuool.

By ontkieming groei die binneste laag van die muur van die koniediums in een enkele kiemdraad uit, en die inhoud van die koniediums passeer oor in die kiemdraad.

Die kiemdraad is 3.4μ in diameter en het 'n kleurlose inhoud. Dit ontstaan by of naby die toppunt van die koniediums en is baie selde bepaald lateraal.

As die koniediums onder gunstige konditiesies op die blaar van 'n geskikte vygie ontkiem, dan dring hul kiemdrade die blaar by sy huidmondjies binne.

Dit lyk asof die koniediums betreklik gou hul ontkiemings-vermoë verloor. In die ontkiemingsproewe, veral in kraanwater, het ek 'n menigte koniediums gekry wat gelyk het asof hulle sonder inhoud was. Eers het ek gedink dat hulle miskien swerspore gevorm het, maar hoewel ek spesiale pogings gemaak het om te kyk of die koniediums nie soms ook swerspore vorm nie, het dit my tog nooit geluk om dit te kry nie.

Identiteit.

Daar die swam blykbaar nog nie beskryf is nie, word die naam *Peronospora mesembryanthemia*, n.sp., vir hom voorgestel en gee ek die volgende korte beskrywing van hom:—

Peronospora mesembryanthemi, n.sp.*

Die miselium is taamlik vertak, kleurloos, intersellulêr, $1.7-3.4 \mu$ dik, sonder dwarsmure; knopvormige houstoria's $.8 \mu$ in diameter teenwoordig.

Die konediofore is regop, 64·6—105·4 μ lank en 6·8—11·2 μ dik, hul groei enkel uit die huidmondjies, is 3—4 maal vertak met ent-takkies of sterigmes, 6·8—11·2 μ lank en 2·8—3·4 μ dik.

Die koniediums is terminaal ovaal tot langwerpig-rond, 27·2—34·0 μ lank by 17·0—20·4 μ breed, kleurloos, buitemuur dik; inhoud fyn korrelagtig; ontkiem altyd deur middel van 'n kiemdraad by of naby die toppunt.

Oöspore nie gesien nie.

Kom voor op sappige deel van stammetjie, blomsteel, blom-bodem, kelkblare, maar veral op blare, en veroorsaak donsige skimmel op *Mesembryanthemum*-soorte in Stellenbosch, K.P., Suid-Afrika.

Materiaal geplaas as No. 1242 in Herb., P. A. van der Byl, Universiteit van Stellenbosch.

BESTRYMIDDELS TEEN DIE SIEKTE.

Tot dusver het ek nog nie die geleentheid gehad om eksperimente vir die kontrole van die siekte uit te voer nie.

Ek is egter van mening dat dieselfde metodes wat teen soortgelike siektes van ander plante gebruik word, ook hier van toepassing sal wees. Gevolglik gee ek aan die hand dat die vygies gedurende die tyd dat die siekte meestal verskyn, elke veertien dae of so bespuit word met bordo-mengsel (1 : 1 : 100). Die bordo-

* *Peronospora mesembryanthemi*, sp. nov.

Mycelio ramoso hyalino ex hyphis intersellularibus 1·7—3·4 μ crassis, non septatis; capitatis houstoriis 8 μ in diametrum.

Conidiophoriis, singularibus, e stomatis egredientibus, erectis, 64·6—105·4 μ longis, 6·8—11·2 μ crassis; plerumque 3 vel 4 diffusis; terminalibus ramis vel sterigmatis 6·8—11·2 μ longis, 2·8—3·4 μ crassis.

Conidiis terminalibus, plerumque ovoideis vel ellipsoideis 27·2—34·0 μ longis, 17·0—20·4 μ latis, intus hyalinis, minute granulosus, crassis episporiis, semper per tubum germantibus in apice vel prope apicem.

Oosporis non visis.

Hab. in foliis vivis, etc., Mesembryanthemi spp., et causa est plumosi mucoris, Stellenbosch, Africae australis.

mengsel sal die plante vlek; en waar dit dus in tuine soms onwenslik is, sou ek ammoniakaliese-koperkarbonaat (koperkarbonaat, 5 ons; sterk ammonia (·88) 3 pinte; water, 50 gellings) in die plek van bordo-mengsel aanbeveel. Verder sou ek aanbeveel dat sover as prakties dooie takkies, ens., afgepluk en vernietig word. Soos ek reeds genoem het lyk dit asof die siekte veral erg voorkom in koeler plekke, en ek sou dus aanbeveel dat kliptuine so gemaak word dat al die kante goed son kry. Dit sou miskien ook raadsaam wees om die vygies nie te dig op mekaar te laat groei nie, sodat die plante altyd goed belug sal wees, want klammigheid is gunstig vir die verspreiding van die siekte.

ENGLISH SUMMARY.

(1) This paper deals with a downy mildew disease of *Mesembryanthemum* spp., caused by *Peronospora mesembryanthemi*, n.sp.

(2) Symptoms: The first indication of the disease is the appearance of a downy mildew especially on the leaves. After a short time the leaves begin to shrivel up, turn yellow from the top of the leaf, wither and fall off. Other parts of the plant attacked are the succulent parts of the stem, flower stalk, axis and calyx.

(3) The mycelium is fairly branched, colourless, intercellular, 1·7—3·4 thick and non-septate; haustoria 8 μ in diameter are present.

(4) The conidiophores emerge singly from the stomata, and measure 64·6—105·4 μ x 6·8—11·2 μ and consist of a central axis from which lateral branches arise; the ultimate branchlets or sterigmata measure 6·8—11·2 μ x 2·8—3·4 μ .

(5) The conidia are hyaline, ovate to broad elliptic 27·2—34 μ x 17·0—20·4 μ with granular contents. As the conidia become older, one central vacuole appears in them.

(6) The conidia germinate by means of a germ tube at or near its apex. In a few cases it was found to be distinctly lateral. They germinate best in rain water. Zoospores were not found.

VERKLARENDE AANTEKENINGE BY DIE ILLUSTRASIES.

Fig. 1. Foto van vygie-takkies besmet met *Peronospora mesembryanthemi*. Let op die donsige gewas op die blare.

Fig. 2. Foto van 'n vygie-bossie wat met *Peronospora mesembryanthemi* besmet is, baie van sy blare het al afgeval en ander is verwelk.

Fig. 3. Sketse van *Peronospora mesembryanthemi*; almal is vergroot :

(a) koniediums; (b) koniediums kort voor ontkieming, en elk-
een met 'n groot vakuool; (c) ontkiemende koniediums in ver-
skillende stadiums; (d) 'n konediofoor wat by 'n huidmondjie
uitgroeï; 'n paar koniediums wys ook; (e) sterigmes, die ent-
takkies waaraan die koniediums gedra word; (f) miselium van die
swam in die lugruimtes tussen die selle van die vygie-blaar; hy
gee houstoriums of suigorgane in die selle uit.

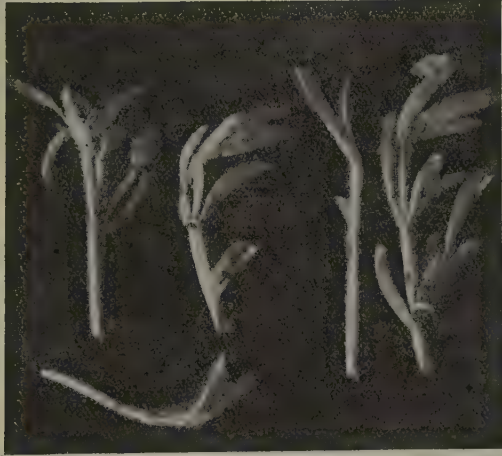


Fig 1.

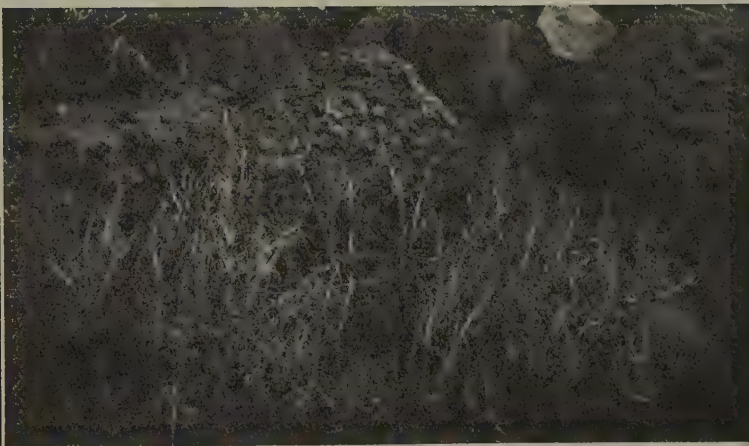
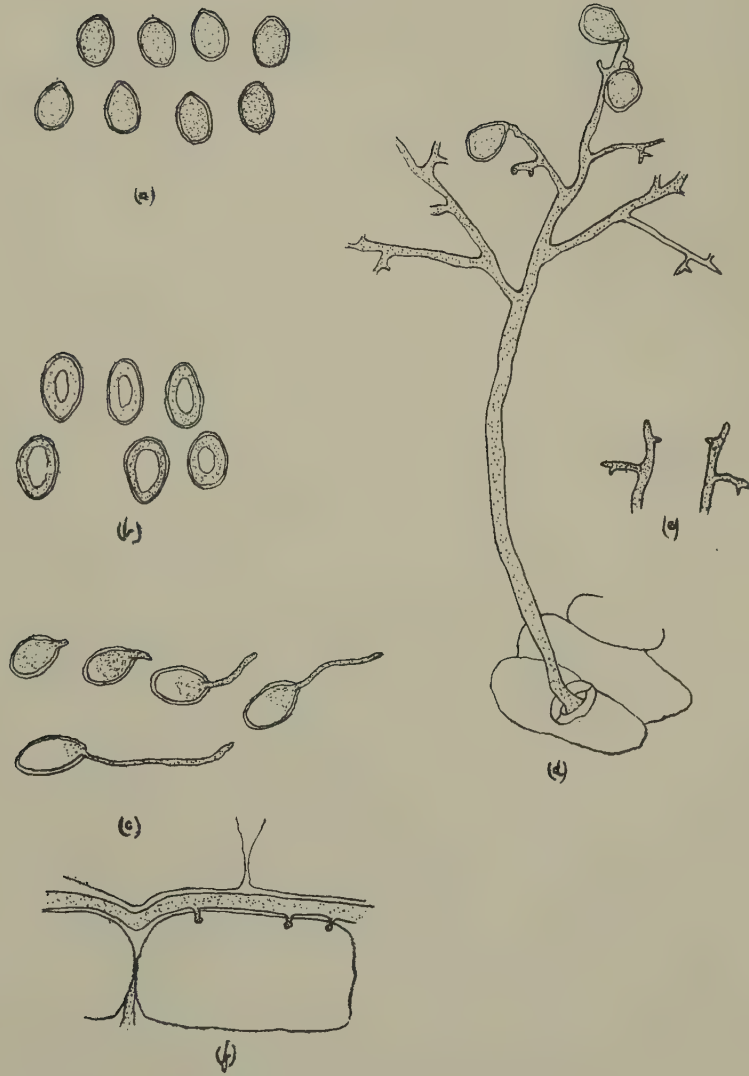


Fig 2



Host Plant Index of South African Scale Insects (*Coccidae*) with a List of Species found on each plant recorded.

BY

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Aberia, see *Dovyalis*.

Abies, CONIFERAE.

Chrysomphalus rossi Mask.

Lecanium sp.

Abutilon, MALVACEAE.

Chrysomphalus aurantii Mask.

Pseudococcus sp.

Acacia baileyana F. Meull, LEGUMINOSAE.

Icerya purchasi Mask.

Acacia caffra (Willd.), LEGUMINOSAE.

Lecanium pseudelongatum Brain.

Pseudococcus nitidus Brain.

Acacia cultriformis (A. Cunn.), LEGUMINOSAE.

Chrysomphalus aurantii Mask.

Chrysomphalus rossi Mask.

Acacia dealbata Link., LEGUMINOSAE.

Aspidiotus (*Diaspidiotus*) pectinatus Ldgr.

Chrysomphalus aurantii Mask.

Acacia decurrens Willd., LEGUMINOSAE.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Acacia horrida Willd., see *A. karroo* Hayne.

Acacia karroo Hayne, LEGUMINOSAE.

Aspidiotus *furcellae* Brain.

Aspidiotus (*Diaspidiotus*) pectinatus Ldgr.

Ceroplastes mimosae Sign.

Chrysomphalus phenax Ckll.

Diaspis newsteadi Leon.

- Lecaniodiaspis mimosae* Mask.
Parafairmairea patellaeforme Brain.
Pseudaonidia glandulosa Newst.
Pseudococcus quaesitus Brain.
Tachardia albida Ckll.
Tachardia decorella Mask.
Acacia melanoxylon R.Br., LEGUMINOSAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (Hemiberlesea) *rapax* Comst.
 Ceroplastes zonatus Newst.
 Chrysomphalus rossi Mask.
 Icerya purchasi Mask.
 Lecanium elongatum Sign.
 Pseudaonidia laciniae Brain.
 Saissetia kellyi Brain.
 Tachardia decorella Mask.
Acacia mollissima Willd., LEGUMINOSAE.
 Ceroplastes zonatus Newst.
 Chrysomphalus aurantii Mask.
Acacia robusta (Burch), LEGUMINOSAE.
 Aspidoproctus tricornis Newst.
 Pseudococcus quaesitis Brain.
Acacia saligna (Wendl.), LEGUMINOSAE.
 Aspidiotus hederæ (Vall.) Sign.
Acacia, sp. indet., LEGUMINOSAE.
 Amorphococcus acaciae Brain.
 Aspidoproctus mirabilis Ckll.
 Ceroplastes egabarum Ckll.
 Ceroplastes zonatus Newst.
 Chrysomphalus aurantii Mask.
 Pseudococcus solitarius Brain.
 Pseudococcus filamentosus Ckll.
Acer sp., ACERACEAE.
 Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
 Aspidiotus (Hemiberlesea) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus rossi Mask.
 Icerya purchasi Mask.
 Lecanium hesperidum Linn.
Acokanthera venenata G.Don., APOCYNACEAE.
 Aspidiotus hederæ (Vall.) Sign.

- Adansonia digitata* Linn., BOMBACACEAE.
Pseudaonidia tesserata de Charmoy.
 African Mahogany, see *Khaya senegalensis*.
Agapanthus umbellatus L'Herit, LILIACEAE.
Pseudococcus lounsburyi Brain.
Agave americana Linn., AMARYLLIDACEAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus aurantii Mask.
Albizzia lophantha Benth., LEGUMINOSAE.
Pseudococcus capensis Brain.
 Almond, see *Amygdalus communis*.
Alnus glutinosa Gaerth., BETULACEAE.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Chrysomphalus aurantii Mask.
Aloe haemanthifolia.
Aspidiotus fimbriatus Capensis Newst.
Aloe rupestris Baker, LILIACEAE.
Furcaspis capensis (Walker) Green.
Aloe sp. indet., LILIACEAE.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Aspidiotus regius Brain.
Chionaspis exalbida Ckll.
Chionaspis humilis Brain.
Chionaspis margaritæ Brain.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Furcaspis capensis (Walker) Green.
Alternanthera sessilis R.Br., AMARANTACEAE.
Chionaspis (*Pinnaspis*) *cyanogena* Ckll.
 Amatungulu, see *Carissa grandiflora*.
Ampelopsis sp., VITACEAE.
Chrysomphalus aurantii Mask.
Chrysomphalus dictyospermi var *pinnulifera* Mask.
Amygdalus communis Bunge, ROSACEAE.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus corticosus Brain.
Diaspis (*Aulacaspis*) *pentagona* (Targ.).

- Anona senegalensis* Pers. (Anonaceae).
 Chrysomphalus dictyospermi Morgan.
Ananas sativus Schult, BROMELIACEAE.
 Diaspis bromeliae (Kerner) Sign.
 Pseudococcus bromeliae Brain.
Andropogon amplexans Nees, GRAMINEAE.
 Aspidiotus kellyi Brain.
Andropogon schoenanthus Linn., GRAMINEAE.
 Chionaspis stanotophri Cooley.
Angophora lanceolata (Cav.), MYRTACEAE.
 Chrysomphalus ficus Ashmead.
Anona reticulata Linn., ANONACEAE.
 Ceroplastes destructor (Newst.).
 Lecanium hesperidum Linn.
 Pseudococcus capensis Brain.
Anacardium occidentale, ANACARDIACEAE.
 Pseudaonidia trilobitiformis Green.
Anthurium sp., ARACEAE.
 Chrysomphalus ficus Ashmead.
 Lecanium spr.
 Parlatoria pergandei Comst.
Apodytes dimidiata E.Mey., ICACINACEAE.
 Calycicoccus merwei Brain.
 Apple, see *Pirus malus*.
 Apricot, see *Prunus armeniaca*.
Aralia, ARALIACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus dictyospermi Mask.
 Chrysomphalus ficus Ashmead.
 Lecanium hesperidum Linn.
 Pseudococcus citri Risso.
Araucaria braziliensis (Loud.) CONIFERAE.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Eriococcus araucariae Mask.
 Pseudococcus aurilanus Mask.

- Araucaria bidwilli* (Hook), CONIFERAE.
 Chrysomphalus rossi Mask.
 Pseudococcus aurilanatus Mask.
Araucaria cookii R.Br., CONIFERAE.
 Eriococcus araucariae Mask.
 Pseudococcus aurilanatus Mask.
Araucaria cunninghami (Sweet), CONIFERAE.
 Eriococcus araucariae Mask.
 Pseudococcus aurilanatus Mask.
Araucaria excelsa R.Br., CONIFERAE.
 Chrysomphalus aurantii Mask.
 Eriococcus araucariae Mask.
 Pseudococcus aurilanatus Mask.
Araucaria imbricata Pav., CONIFERAE.
 Chrysomphalus rossi Mask.
Arbutus sp., ERICACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Lecanium sp.
Arthrosolen polycephalus C. A. Mey, THYMELIACEAE.
 Aspidiotus (*Selenaspidus*) *griqua* Brain.
Arum lily, see *Zantedeschia aethiopica*.
Arundinaria tessellata (Munro), GRAMINEAE.
 Asterolecanium bambusae Bdv.
Ash, Cape, see *Ekebergia capensis*.
Asparagus, LILIACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Saissetia hemisphaerica (Targ.).
Asparagus capensis L., LILIACEAE.
 Lichtensia asparagi Brain.
Aspidistra sp., LILIACEAE.
 Chionaspis (*Pinnaspis*) *aspidistrae* Sign.
 Chrysomphalus ficus Ashmead.
 Lecanium hesperidum Linn.
 Pseudococcus nipae Mask.
Asplenium sp. (fern), POLYPODIACEAE.
 Chionaspis (*Pinnaspis*) *aspidistrae* Sign.
 Saissetia hemisphaerica Targ.

- Aster (roots of), COMPOSITAE.
 Pseudococcus transvaalensis Brain.
- Aucuba japonica* Thunb., CORNACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (Hemiberlesea) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Ischnaspis longirostris Sign.
- Avocada* pear, see *Persea gratissima*.
- Balsam, see *Impatiens capensis*.
- Bamboo, see *Bambusa balcooca* or *Arundinaria tessellata*.
- Bambusa* sp., GRAMINEAE.
 Asterolceanium bambusae Boisduval.
 Chionaspis simplex Green var.
- Banana, see *Musa sapientium*.
- Banana, wild, see *Streletzia augusta*.
- Boabab, see *Adansonia digitata*.
- Barringtonia acutangula*, MYRTACEAE.
 Chrysomphalus ficus Ashmead.
- Barringtonia racemosa*, MYRTACEAE.
 Chrysomphalus dictyospermi Morgan.
- Bauhinia* sp., LEGUMINOSAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
 Chrysomphalus dictyospermi Morgan.
 Chrysomphalus rossi Mask.
 Howardia biclavis Comst.
 Lecanium hesperidum Linn.
- Bauhinia purpurea* Linn, LEGUMINOSAE.
 Chrysomphalus aurantii Mask.
- Begonia* sp., BEGONIACEAE.
 Aspidiotus (Hemiberlesea) *rapax* Comst.
 Chrysomphalus ficus Ashmead.
 Lecanium hesperidum Linn.
 Pseudococcus citri (Risso).
- Belombre, see *Phytolacca dioica*.
- Benthamia* sp., CORNACEAE.
 Chrysomphalus aurantii Mask.
- Berberis* sp., BERBERIACEAE.
 Aspidiotus hederæ (Vall.) Sign.

- Aspidiotus (Diaspidiotus) pectinatus Ldgr.
 Aspidiotus (Selanaspides) silvaticus Ldgr.
 Chrysomphalus aurantii Mask.
 Chrysomphalus rossi Mask.
 Diaspis (Aulacaspis) pentagona Targ.
 Lecanium hesperidum Linn.
 Beukenhout, see Faurea saligna.
 Bignonia sp., BIGNONIACEAE.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Diaspis (Aulacaspis) pentagona Targ.
 Howardia biclavis Comst.
 Orthezia insignis Dougl.
 Billbergia sp., BROMELIACEAE.
 Diaspis bromeliae Kerner.
 Bimbe Plum, see Garcinia livingstonei.
 Blackwood, see Acacia melanoxylon.
 Borbonia cordata (Linn.), LEGUMINOSAE.
 Asterolecanium borboniae Brain.
 Pseudococcus mirabilis Brain.
 Pseudococcus stelli Brain.
 Pseudococcus var. tylococciformis Brain.
 Sphaerococcus africanus Brain.
 Bougainvillaea, NYCTAGINACEAE.
 Chrysomphalus aurantii Mask.
 Icerya purchasi Mask.
 Bouvardia, RUBIACEAE.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Chrysomphalus aurantii Mask.
 Diaspis (Aulacaspis) pentagona Targ.
 Lecanium hesperidum Linn.
 Pseudococcus citri var. phenacocciformis Brain.
 Box, see Buxus sempervirens.
 Brabeium stellatifolium Linn., PROTEACEAE.
 Lecaniodiaspis brabei Brain.
 Brachystegia randii Baker, LEGUMINOSAE.
 Aspidoproctus ornatus Newst.
 Brachystegia spicaeformis.
 Aspidoproctus maximus Newst.

Brexia madagascariensis, SAXIFRAGACEAE.

Chry. distyospermi Morgan.

Buchu, see *Diosma* spp.

Buxus sempervirens (Linn.), BUXACEAE.

Aspidiotus hederæ (Voll.) Sign.

Aspidiotus (Hemiberlesea) *lataniae* Sign., Green.

Chionaspis (Poliaspis) *carissae* Ckll.

Chrysomphalus aurantii Mask.

Chrysomphalus ficus Ashmead.

Chrysomphalus rossi Mask.

Lecanium hesperidum Linn.

Caladium sp., ARACEAE.

Chrysomphalus ficus Ashmead.

Callistemon sp., MYRTACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus ficus Ashmead.

Chrysomphalus rossi Mask.

Icerya purchasi Mask.

Lecanium sp.

Callitris sp., PINACEAE.

Aspidiotus hederæ (Vall.) Sign.

Calodendron capense (Thunb.), RUTACEAE.

Aspidiotus perniciosus Comst.

Cerococcus ornatus Green.

Chionaspis (Phenacaspis) *natalensis*.

Chrysomphalus aurantii Mask.

Chrysomphalus dictyospermi Morg. (dark form.).

Howardia moorsi Doane & Ferris.

Camellia, TERNSTROEMIACEAE.

Aspidiotus (Hemiberlesea) *lataniae* Sign., Green.

Aspidiotus (Morganella) *maskelli* Ckll.

Aspidiotus (Selenaspis) *silvaticus* Ldgr.

Chrysomphalus aurantii Mask.

Chrysomphalus dictyospermi Mask (dark form.).

Chrysomphalus ficus Ashmead.

Chrysomphalus rossi Mask.

Fiorinia fiorinae Targ.

Lecanium hesperidum Linn.

Orthezia insignis Dougl.

Pseudaonidia clavigera Ckll.

- Camphor, see *Cinnamomum camphora*.
- Cape gooseberry, see *Physalis peruviana*.
- Cape Heath, see *Erica*.
- Capparis albitrunca (Burch), CAPPARIDACEAE.
Chionaspis capparis Brain.
Chionaspis (*Pinnaspis*) *chionaspitiformis* Green.
Chionaspis retigera Ckll.
- Capparis sp., CAPPARIDACEAE.
Chrysomphalus rossi (Mask) var. *greeni* Brain & Kelly.
- Capsicum minimum (Blanco), SOLANACEAE.
Chrysomphalus aurantii Mask.
- Carex sp., CYPERACEAE.
Chrysomphalus ficus Ashmead.
- Carica papaya Linn., CARICACEAE.
Aspidiotus (*Morgnella*) *maskelli* Ckll.
Lecanium hesperidum Linn.
- Carissa grandiflora (A.DC.), APOCYNACEAE.
Aspidiotus (*Selenaspidus*) *articulatus* Morgan.
Chionaspis (*Poliaspis*) *carissae* Ckll.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.
Filippia carissae Brain.
- Carnation, see *Dianthus caryophyllus*.
- Carob, see *Ceratonia siliqua*.
- Caralluma caudata N.E.Br., ASCLEPIADACEAE.
Asterolecanium stentae Brain.
- Cashew Tree, see *Anacardium occidentale*.
- Cassia sp., LEGUMINOSAE.
Chrysomphalus aurantii Mask.
- Cassia fistulosa (Indian laburnum).
Aspidoproctus mirabilis Newst.
- Castanea vulgaris (Lam), FAGACEAE.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus rossi Mask.
Lecanium hesperidum Linn.
- Castanospermum australe (A. Cun & Fraser), LEGUMINOSAE.
Chrysomphalus ficus Ashmead.

- Castanospermum* sp., LEGUMINOSAE.
 Chrysomphalus aurantii Mask.
 Chrysomphalus rossi Mask.
 Castor-oil plant, see *Ricinus communis*.
Casuarina quadrivalvis (Labill), CASUARINACEAE.
 Chrysomphalus aurantii Mask.
Casuarina stricta Dryand, CASUARINACEAE.
 Chrysomphalus aurantii Mask.
Catalpa sp., BIGNONIACEAE.
 Chrysomphalus rossi Mask.
 Diaspis (*Aulacaspis*) *pentagona* (Targ.).
Cedrela toona (Roxb.), MELIACEAE.
 Chrysomphalus aurantii Mask.
 Diaspis (*Aulacaspis*) *pentagona* (Targ.).
 Saissetia subpatelliforme Newst.
Celastrus sp., CELASTRACEAE.
 Chrysomphalus corticosus Brain.
Celastrus cordata E.M., CELASTRACEAE.
 Ceronema mobilis Brain.
Celastrus laurinus (Thunb.), CELASTRACEAE.
 Aspidiotus (*Selenaspis*) *celastri* Mask.
Celtis rhamnoides D.C., ULMACEAE.
 Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Cenia turbinata Pers., COMPOSITAE.
 Pseudococcus capensis Brain.
Centaurea cyanus (Linn.), COMPOSITAE.
 Pseudococcus transvaalensis Brain.
 Century plant, see *Agave americana*.
Ceratonis siliqua (Linn.), LEGUMINOSAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
Ceratonis sp., LEGUMINOSAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
 Chrysomphalus rossi Mask.
Cestrum, SOLANACEAE.
 Chrysomphalus aurantii Mask.
 Orthezia insignis Dougl.
Chaetachme aristata Planch, ULMACEAE.
 Aonidia chaetachmeae Brain.

- Aspidiotus gowdeyi* Newst.
Aspidiotus transparents Green.
Chionaspis (*Poliaspis*) *carissae* Ckll.
Chionaspis chaetachmeae Brain.
Chionaspis retigera Ckll.
Chrysomphalus dictyospermi Mask.
Chrysomphalus rossi Mask.
Ischnaspis longirostris Sign.
Pseudococcus citri Risso.
 Cherry, see *Prunus cerasus*.
 Chestnut, see *Castanea vulgaris*.
 Chestnut, Cape, see *Calodendron capense*.
 Chili, see *Capsicum minimum*.
Chilianthus oleaceus Burch, LOGANIACEAE.
 Filippia chilianthi Brain.
Choisya ternata (H.B. & K.), RUTACEAE.
 Chrysomphalus aurantii Mask.
Chrysanthemum, COMPOSITAE.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Orthezia insignis Dougl.
 Pseudococcus transvaalensis Brain.
Chrysocoma tenuifolia (Berg), COMPOSITAE.
 Tylococcus chrysocomae Brain.
Chrysophyllum magaliesmontanum (Loud.), SAPOTACEAE.
 Aspidiotus (*Selenaspidus*) *silvaticus* Ldgr.
 Pseudococcus filamentosus Ckll.
Chrysophyllum sp., SAPOTACEAE.
 Chrysomphalus aurantii Mask.
Cinnamomum camphora (T. Neese & Eberm), LAURACEAE.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus dictyospermi Mask.
 Lecanium sp.
Cissus cuneifolia E. & Z., VITACEAE.
 Cissococcus fulleri Ckll.
Citharexylum sp., VERBENACEAE.
 Orthezia insignis Dougl.

Citrus spp., RUTACEAE.

- Aspidiotus hederæ (Vall.) Sign.
- Aspidiotus (Morganella) maskelli Ckll.
- Aspidiotus (Selenaspidus) silvaticus Ldgr.
- Ceroplastes destructor Newst.
- Chrysomphalus aurantii Mask.
- Chrysomphalus dictyospermi Morg.
- Chrysomphalus dictyospermi var. pinnulifera Mask.
- Chrysomphalus ficus Ashmead.
- Chrysomphalus rossi Mask.
- Filippia chilianthi Brain.
- Ischnaspis longirostris Sign.
- Lecanium africanum Newst.
- Lecanium hesperidum Linn.
- Lepidosaphes pinniformis (Bche).
- Lepidosaphes gloveri Packard.
- Parlatoria zizyphi (Lucas) Sign.
- Pseudococcus citri Risso.
- Pseudococcus filamentosus Ckll.
- Pseudococcus fragilis Brain.
- Pseudococcus virgatus Ckll.
- Tachardia actinella Ckll & King.
- Pulvinaria floccifera Westw.

Clematis vitalba (Linn.), RANUNCULACEAE.

- Pseudococcus capensis Brain.

Clematis sp., RANUNCULACEAE.

- Chrysomphalus aurantii Mask.

Clerodendron, VERBENACEAE.

- Aspidiotus (Diaspidiotus) pectinatus Ldgr.
- Chrysomphalus aurantii Mask.

Cliffortia ruscifolia (Linn.), ROSACEAE.

- Pseudococcus segnis Brain.
- Sphaerococcus africanus Brain.

Cliffortia serrulata Reichm., ROSACEAE.

- Icerya natalensis Mask.

Clivia sp., AMARYLLIDACEAE.

- Chrysomphalus aurantii Mask.

Coffea arabica (Linn.), RUBIACEAE.

- Lecanium africanum Newst.
- Pseudococcus filamentosus Ckll.

Coffee, see Coffea arabica.

Coleus, LABIATAE.

Orthezia insignis Dougl.

Pseudococcus citri Risso.

Colocasia, ARACEAE.

Chrysomphalus ficus Ashmead.

Combretum sp., COMBRETACEAE.

Ceroplastes combreti Brain.

Chrysomphalus dictyospermi Morg.

Saissetia persimile Newst.

Convallaria sp., LILIACEAE.

Chrysomphalus aurantii Mask.

Convolvulus sp., CONVOLVULACEAE.

Aspidiotus hederæ (Vall.) Sign.

Pseudococcus virgatus Ckll.

Coprosma, RUBIACEAE.

Aspidiotus hederæ (Vall.) Sign.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

Chrysomphalus aurantii Mask.

Lecanium hesperidum Linn.

Cordyline sp., LILIACEAE.

Chrysomphalus aurantii Mask.

Cornflower, see *Centaurea cyanus*.

Cornus candidissima (Mill.), CORNACEAE.

Chrysomphalus aurantii Mask.

Cornus circinata L'Herit, CORNACEAE.

Chrysomphalus aurantii Mask.

Cosmos, COMPOSITAE.

Orthezia insignis Dougl.

Cotoneaster sp., ROSACEAE.

Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

Chrysomphalus aurantii Mask.

Chrysomphalus rossi Mask.

Cotton, see *Gossypium*.

Crassula sp., CRASSULACEAE.

Aspidiotus hederæ Vall.

Crataegus sp., ROSACEAE.

Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Chrysomphalus rossi Mask.

- Icerya purchasi* Mask.
Lecanium hesperidum Linn.
Crataegus lalandii, ROSACEAE.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Croton sp., EUPHORBIACEAE.
Aspidiotus hederae (Vall.) Sign.
Chrysomphalus rossi Mask.
Chrysomphalus dictyospermi Morg.
Lepidosaphes pinniformis (Bche).
Parlatorea pergandei Comst.
Pseudococcus capensis Brain.
Pseudococcus citri Risso.
Pseudococcus virgatus Ckll.
Saissetia hemisphaerica Targ.
Cryptomeria japonica (D.Don.), PINACEAE.
Chrysomphalus aurantii Mask.
Chrysomphalus rossi Mask.
Cryptostemma calendulaceum (R.Br.), COMPOSITAE.
Pseudococcus capensis Brain.
Cucumis sp., CUCURBITACEAE.
Pseudococcus capensis Brain.
Cupressus spp., PINACEAE.
Aspidiotus hederae (Vall.) Sign.
Chrysomphalus aurantii Mask.
Chrysomphalus rossi Mask.
Diaspis carueli Targ.
 Currant, see *Ribes* sp.
 Custard Apple, see *Anona reticulata*.
 Cycad, CYCADACEAE.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Saissetia hemisphaerica Targ.
Chr. dictyospermi (Morg.).
Cydonia vulgaris Pers., ROSACEAE.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Aspidiotus (*Diaspidiotus*) *perniciosus*, Comst.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Asterolecanium brevispinum Brain.
Ceroplastes rusci Linn.
Chrysomphalus aurantii Mask.

- Chrysomphalus rossi* Mask.
Lecanium sp.
Cydonia candida?
Asp. perniciosus, Comst.
Cynodon sp., GRAMINEAE.
Allopulvinaria subterranea Brain.
Monophlebus fulleri Ckll.
Cynodon dactylon Pers., GRAMINEAE.
Monophlebus africanus Brain.
Cyperus, CYPERACEAE.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Cytinus laburnum Linn., LEGUMINOSEAE.
Icerya purchasi Mask.
Dahlia sp., COMPOSITAE.
Chrysomphalus aurantii Mask.
Daisy, see *Bellis perennis* Linn.
Datura suaveolens Humb & Bonpl., SOLANACEAE.
Aspidiotus hederæ (Vall.) Sign.
Deutzia sp., SAXIFRAGACEAE.
Chrysomphalus aurantii Mask.
Deutzia gracilis (Sieb), SAXIFRAGACEAE.
Aspidiotus (Diaspidiotus) pectinatus Ldgr.
Dianthus caryophyllus (Linn.), CARYOPHYLLACEAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus rossi Mask.
Lecanium hesperidum Linn.
Digitalis purpurea (Linn.), SCROPHULARIACEAE.
Pseudococcus burnerae Brain.
Dioon sp., CYCADACEAE.
Chrysomphalus ficus Ashmead.
Diosma crenata Linn, RUTACEAE.
Chionaspis (Diaspis) diosmae Brain.
Diospyros kaki (Linn.), EBENACEAE.
Aspidiotus (Diaspidiotus) pectinatus Ldgr.
Aspidiotus (Hemiberlesea) rapax Comst.
Chrysomphalus aurantii Mask.
Dombeya, STERCULIACEAE.
Chrysomphalus aurantii Mask.
Lecaniodiaspis tarsalis Brain.

Doryanthes, AMARYLLIDACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus ficus Ashmead.

Doryalis caffra Harv., FLACOURTIACEAE.

Aspidiotus hederæ (Vall.) Sign.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

Aspidiotus (*Selenaspidus*) *silvaticus* Ldgr.

Cerococcus ornatus Green.

Ceroplastes sp.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Chrysomphalus rossi Mask.

Lecanium hesperidum Linn.

Pseudococcus sp.

Saissetia oleæ Bern.

Saissetia perseæ Brain.

Dracaena australis (Forst), LILIACEAE.

Aspidiotus (*Selenaspidus*) *silvaticus* Ldgr.

Ischnaspis longirostris (Sign).

Dracaena sp., LILIACEAE.

Aspidiotus hederæ (Vall.) Sign.

Chrysomphalus aurantii Mask.

Chrysomphalus dictyospermi Morg.

Chrysomphalus ficus Ashmead.

Chrysomphalus rossi Mask.

Pseudococcus adonidum (Westw.).

Duranta, VERBENACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus rossi Mask.

Howardia biclavis Comstock.

Orthezia insignis Dougl.

Ehretia hottentotica Burch, BORRAGINACEAE.

Aonidia simplex Leon.

Aspidiotus (*Diaspidiotus*) *ehretiae* Brain.

Lecanium ehretiae Brain.

Ekebergia capensis D.C., MELIACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Chrysomphalus rossi Mask.

Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.

Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.

- Ekebergia meyeri (Presl.), MELIACEAE.
 Chrysomphalus aurantii Mask.
- Ekebergia sp., MELIACEAE.
 Chionaspis (Phenacaspis) lounsburyi ekebergiae Brain.
- Elaeagnus sp., ELAEAGNACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
 Lecanium sp.
- Elaeodendron croceum (Thunb.), D.C., CELASTRACEAE.
 Chrysomphalus ficus Ashmead.
- Elaeocarpus grandis, TILIACEAE.
 Chrysomphalus ficus Ashmead.
- Elm, see Ulmus montana.
- Elytropappus rhinocerotis Less, COMPOSITAE.
 Baccacoccus elytropappi Brain.
 Ceroplastes tachardiaformis Brain.
 Inglisia elytropappi Brain.
 Pseudococcus elizabethae Brain.
 Sphaerococcus africanus Brain.
 Tachardia karroo Brain.
 Tachardia minor Brain.
- Encephalartos sp., CYCADACEAE.
 Aspidiotus fimbriatus capensis Newst.
 Chrysomphalus rossi Mask.
- Erica sp., ERICACEAE.
 Icerya purchasi Mask.
- Eriobotrya japonica (Lindl.), ROSACEAE.
 Aspidiotus (Diaspidiotus) perniciosus Comst.
 Aspidiotus (Hemiberlesea) rapax Comst.
- Erythrina caffra (Thunb.), LEGUMINOSAE.
 Chrysomphalus aurantii Mask.
 Diaspis (Aulacaspis) pentagona (Targ.).
 Pulvinaria aristolochiae Newst.
 Howardia moorsi Doane & Ferris.
- Essenhout, see Ekebergia meyeri.
- Eucalyptus cornuta (Labill), MYRTACEAE.
 Aspidiotus (Hemiberlesea) rapax Comst.
- Eucalyptus sp., MYRTACEAE.
 Chrysomphalus rossi Mask.
 Chrysomphalus aurantii Mask.

- Icerya purchasi* Mask.
- Monophlebus fortis* Ckll.
- Euclea natalensis* A.D.C., EBENACEAE.
- Chionaspis* (*Dinaspis*) *imbricata* Brain.
- Euclea* sp., EBENACEAE.
- Aspidiotus hederæ* (Vall.) Sign.
- Ceroplastes eucleæ* Brain.
- Tachardia affluens* Brain.
- Eugenia* spp., MYRTACEAE.
- Chrysomphalus aurantii* Mask.
- Chrysomphalus ficus* Ashmead.
- Chrysomphalus rossi* Mask.
- Eulalia gracilis*, GRAMINEAE.
- Chionaspis stanotophri* Cooley.
- Euonymus*, CELASTRACEAE.
- Aspidiotus transparens* Green.
- Aspidiotus* (*Diaspidiotus*) *pectinatus* Ldgr.
- Aspidiotus* (*Hemiberlesea*) *rapax* Comst.
- Aspidiotus* (*Selenaspidus*) *silvaticus* Ldgr.
- Chrysomphalus aurantii* Mask.
- Chrysomphalus corticosus* Brain.
- Chrysomphalus ficus* Ashmead.
- Chrysomphalus rossi* Mask.
- Diaspis* (*Epidiaspis*) *conspicua* Brain.
- Lecanium hesperidum* Linn.
- Pseudococcus citri* Risso.
- Eupatorium ageratoides* Linn., COMPOSITAE.
- Orthezia insignis* Dougl.
- Euphorbia*, tree, of Eastern Province, probably
- Euphorbia tetragona* or *E. grandidens*.
- Euphorbia virosa* (Willd.), EUPHORBIACEAE.
- Aspidiotus* (*Selenaspidus*) *euphorbiæ* Newst.
- Euphorbia* tree, EUPHORBIACEAE.
- Aspidiotus* (*Salenaspidus*) *pertusus* Brain.
- Chionaspis euphorbiæ* Brain.
- Chionaspis globosus* Brain.
- Chrysomphalus ficus* Ashmead.
- Conchaspis euphorbiæ* Brain.
- Crytaspidotus austro-africanus* Ldgr.
- Hemilecanium theobromæ* Newst.
- Icerya euphorbiæ* Brain.

Euryops tenuissimus Lees, COMPOSITAE.

Asterolecanium euryopsis Fuller.

Excoecaria africana Mull. Arg., EUPHORBIACEAE.

Chrysomphalus dictyospermi Morg.

Faurea saligna Harvey, PROTEACEAE.

Furcaspis proteae Brain.

Ferns.

Aspidiotus hederæ (Vall.) Sign.

Pseudococcus adonidum West.

Saissetia hemisphaerica Targ.

Ficus australis Willd., MORACEAE.

Chrysomphalus aurantii Mask.

Ficus capensis Thünb., MORACEAE.

Chrysomphalus aurantii Mask.

Ficus carica Linn., MORACEAE.

Aspidiotus hederæ (Vall.) Sign.

Aspidiotus (*Diaspidiotus*) *forbesi* Johns.

Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.

Aspidiotus (*Hemiberlesea*) *lataniae* Sign Green.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

Ceroplastes pallidus Brain.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Icerya purchasi Mask.

Icerya seychellarum Westw.

Lecanium filamentosum Westw.

Lecanium hesperidum Linn.

Pseudococcus burnerae Brain.

Pseudococcus capensis Brain.

Pseudococcus filamentosus Ckll.

Saissetia nigra Nietn.

Ficus elastica.

Saissetia perseae Brain.

Ficus macrophylla.

Saissetia perseae Brain.

Fig, see *Ficus carica*.

Fig, Hottentot's, see *Mesembrianthemum*.

Forsythia, OLEACEAE.

Aspidiotus hederæ (Vall.) Sign.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

- Chrysomphalus aurantii* Mask.
Chrysomphalus rossi Mask.
 Foxglove, see *Digitalis*.
Fragaria sp., ROSACEAE.
Icerya purchasi Mask.
 Frangipani, see *Plumieria rubra*.
Fraxinus sp., OLEACEAE.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Fuchsia sp., ONAGRACEAE.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Diaspis (*Aulacaspis*) *pentagona* (Targ.).
Lecanium hesperidum Linn.
Gamolepis pectinata (Less.), COMPOSITAE.
Aspidiotus (*Diaspidiotus*) *pactinatus* Ldgr.
Garcinia livingstonei, GUTTIFERAE.
Aspidiotus gowdeyi Newst.
Garcinia cochinchinensis, GUTTIFERAE.
Chrysomphalus ficus Ashm.
Garcinia mangostani (Linn.), GUTTIFERAE.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Gardenia globosa Hochet, RUBIACEAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus corticosus Brain.
Gardenia jasminoides Ellis var., RUBIACEAE.
Diaspis (*Epidiaspis*) *conspicua* Brain.
Gardenia sp., RUBIACEAE.
Diaspis (*Epidiaspis*) *conspicua* Brain.
Lecanium hesperidum Linn.
Orthezia insignis Dougl.
Pseudococcus citri Risso.
Pseudococcus filamentosus Ckll.
Genista, LEGUMINOSAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus aurantii Mask.
Geranium sp., GERANIACEAE.
Diaspis (*Aulacaspis*) *pentagona* (Targ.).
Inglisia geranii Brain.
Lecanium hesperidum Linn.
Pseudococcus bechuanæ Brain.

Ginkgo bibloba Linn., GINGKOACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Gleditschia sp., LEGUMINOSAE.

Aspidiotus (Diaspidiotus) pectinatus Ldgr.

Chrysomphalus aurantii Mask.

Diaspis (Auclacaspis) pentagona (Targ.).

Lecanium sp.

Pseudococcus burnerae Brain.

Gorse, Cape, see Borbonia cordata.

Gossypium sp., MALVACEAE.

Pseudococcus filamentosus Ckll.

Pulvinaria jacksoni Newst.

Gourd (Sphaerosicyos sphaerica).

Chionaspis (Phenacaspis) natalensis Ckll.

Granadilla, see Passiflora quadrangularis.

Grape Vine, see Vitis vinifera.

Grass sp. indet., GRAMINEAE.

Aclerda digitata Ckll.

Allopulvinaria subterranea Brain.

Antonina natalensis Brain.

Antonina transvaalensis Brain.

Chionaspis humilis Brain.

Chionaspis stanotophri Cooley.

Idiosaissetia peringueyi Brain.

Margarodes peringueyi Brain.

Margarodes newsteadi Brain.

Margarodes ruber Brain.

Membranaria pretoriae Brain.

Monophlebus fulleri Ckll.

Natalensis fulleri Brain.

Pseudococcus bantu Brain.

Pseudococcus graminus Mask.

Pseudococcus socialis Brain.

Pseudococcus virgatus Ckll.

Pulvinaria lepida Brain.

Grevillea calleyi R.Br., PROTEACEAE.

Chrysomphalus aurantii Mask.

Grevillea hilliana (F. Muell.), PROTEACEAE.

Aspidiotus hederæ (Vall.) Sign.

Chrysomphalus aurantii Mask.

- Grevillea robusta* A. Conn., PROTEACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidoproctus maximus Newst.
 Chrysomphalus aurantii Mask.
 Pseudococcus filamentosus Ckll.
Grewia occidentalis (Linne), TILIACEAE.
 Grewiacoccus gregalis Brain.
Greyia sutherlandi (Hook & Hard.), MELIANTHACEAE.
 Chrysomphalus aurantii Mask.
Guava, see *Psidium pyrifera* Linn.
Gum tree, see *Eucalyptus* spp.
Gymnosporia buxifolia (Linn.), CELASTRACEAE.
 Chionaspis (*Dinaspis*) *lounsburyi* Leon.
 Chrysomphalus corticosus Brain.
Gynura aurantiaca D.C., COMPOSITAE.
 Chrysomphalus aurantii Mask.
Hakea laurina R.Br., PROTEACEAE.
 Chrysomphalus aurantii Mask.
Hakea sp., PROTEACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus rossi Mask.
 Icerya purchasi Mask.
 Lecanium hesperidum Linn.
Hamelia patens (Jacq.), CINCHONACEAE.
 Orthezia insignis Douglas.
Harpuisbosch, see *Euryops tenuissimus* Lees.
Hawthorn, see *Crataegus* sp.
Hedera helix (Linn.), ARALIACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Aspidiotus (*Selenaspidus*) *silvaticus* Ldgr.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Lecanium hesperidum Linn.
Hedysarum coronarium Linn., LEGUMINOSAE.
 Pseudococcus capensis Brain.
Helianthus sp., COMPOSITAE.
 Orthezia insignis Dougl.
Heliotrope, BORRAGINACEAE.
 Diaspis (*Aulacaspis*) *pentagona* Targ.

Hibiscus, MALVACEAE.

- Aspidoproctus maximus Newst.
- Aspidiotus (Diaspidiotus) pectinatus Ldgr.
- Chrysomphalus rossi Mask.
- Diaspis (Aulacaspis) pentagona Targ.
- Lecaniodiaspis natalensis Brain.
- Lecaninodiaspis tarsalis Brain.
- Pseudococcus filamentosus Ckll.
- Saissetia oleae Bernard.
- Tylococcus insolitus (Green).

Hibiscus mutabilis (Linn.), MALVACEAE.

- Chrysomphalus aurantii Mask.
- Diaspis (Epidiaspis) conspicua Brain.

Holly, see *Ilex aquifolium* Linn.

Honeysuckle, see *Lonicera* sp.

Horse chestnut, see *Aesculus hippocastanum* Linn.

Huernia transvaalensis, ASCLEPIADACEAE.

- Asterolecanium stentae Brain.

Hydrangea paniculata (Sieb), SAXIFRAGACEAE.

- Aspidiotus hederæ (Vall.) Sign.
- Chrysomphalus rossi Mask.

Hydrangea, SAXIFRAGACEAE.

- Chrysomphalus aurantii Mask.

Hypericum, HYPERICACEAE.

- Chrysomphalus aurantii Mask.

Hyphaene crinita Gaertn., PALMAE.

- Halimococcus lampas Ckll.

Ilex sp., AQUIFOLIACEAE.

- Aspidiotus (Diaspidiotus) pectinatus Ldgr.
- Chrysomphalus ficus Ashmead.

Ilex aquifolium (Linn.), AQUIFOLIACEAE.

- Aspidiotus (Hemiberlesea) rapax Comst.
- Chrysomphalus aurantii Mask.
- Lecanium hesperidum Linn.

Impatiens sp., BALSAMINACEAE.

- Aspidiotus (Hemiberlesea) rapax Comst.
- Chrysomphalus aurantii Mask.

Impatiens capensis (Meerb.), BALSAMINACEAE.

- Pseudococcus capensis Brain.

Indian Jasmine, see *Jasminum officinale*.

Indian Mahogany, see *Cedrela toona* (Roxb.).

Iris, IRIDACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus rossi Mask.

Iron Weed, see *Sida rhombifolia* Linn.

Ivy, see *Hedera helix*.

Ixia, IRIDACEAE.

Chrysomphalus ficus Ashmead.

Chrysomphalus rossi Mask.

Ixora CINCHONACEAE.

Orthezia insignis Dougl.

Jacaranda mimosaefolia D.Don., BIGNONIACEAE.

Chrysomphalus aurantii Mask.

Icerya purchasi Mask.

Orthezia insignis Dougl.

Pseudococcus filamentosus Ckll.

Jasminum sambac (Soland), OLEACEAE.

Icerya purchasi Mask.

Jasminum sambac (Soland), OLEACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus ficus Ashmead.

Jasmine sp., OLEACEAE.

Aspidiotus hederae (Vall.) Sign.

Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

Chrysomphalus aurantii Mask.

Chrysomphalus rossi Mask.

Juglans regia (Linn.), JUGLANDACEAE.

Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.

Chrysomphalus aurantii Mask.

Chrysomphalus corticosus Brain.

Diaspis pentagona Targ.

Kaffir Boom, see *Erythrina caffra* Thunb.

Kaffir plum, see *Harpephyllum caffrum*.

Karree boom, see *Rhus lancea* or *R. viminalis*.

Kei apple, see *Dovyalis caffra*.

Kennedya sp., LEGUMINOSAE.

Chrysomphalus aurantii Mask.

Diaspis (*Aulacaspis*) *pentagona* Targ.

Keur-boom, see *Virgilia capensis* Lam.

- Khaya senegalensis* A. Juss, MELIACEAE.
Chionaspis (*Pinnaspis*) *chionaspitifomis* Green.
Chrysomphalus rossi Mask.
Kiggelaria africana Linn., FLACOURTIACEAE.
Chionaspis (*Poliaspis*) *kiggelariae* Brain.
Kruisbessie, see *Grewia occidentalis*.
Laburnum, see *Cytinus laburnum*.
Lagerstroemia indica Linn., LYTHRACEAE.
Aspidiotus (*Morganella*) *maskelli* Ckl.
Howardia moorsi Doane & Ferris.
Lagerstroemia sp., LYTHRACEAE.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus dictyospermi Morg. (dark form.).
Lantana sp., VERBENACEAE.
Orthezia insignis Dougl.
Laythyrus odoratus Linn., LEGUMINOSAE.
Icerya purchasi Mask.
Laurel, see *Laurus nobilis* (Linn.)
Laurus nobilis (Linn.), LAURACEAE.
Aspidiotus hederae (Vall.) Sign.
Aspidiotus (*Selenaspidus*) *pertusus* Brain.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.
Laurestinus, see *Viburnum tinus* Linn.
Lavender, see *Lavendula vera* D.C.
Lavendula vera D.C., LABIATAE.
Icerya purchasi Mask.
Lemon, see *Citrus* spp.
Lemon grass, see *Andropogon schoenanthus*.
Leptospermum laevigatum (F. Meull), MYRTACEAE.
Lecanium wistariae Brain.
Leucadendron argenteum R.B., PROTEACEAE.
Chionaspis leucadendri Brain.
Pseudococcus trichileae Brain.
Libocedrus decurrens (Torr.), CONIFERAE.
Chrysomphalus rossi Mask.
Libonia sp., LILIACEAE.
Chrysomphalus aurantii Mask.

- Ligustrum japonicum* Host, OLEACEAE.
 Aspidiotus hederae (Vall.) Sign.
 Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus corticosus Brain.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Howardia biclavis Comst.
Lilac, see *Syringa vulgaris* (Linn.)
Lilac, Cape, see *Ehretia hottentotica*.
Lily, see *Lilium candidum* (Linn.)
Lilium candidum (Linn.), LILIACEAE.
 Chrysomphalus ficus Ashmead.
Liriodendron tulipifera Linn., MAGNOLIACEAE.
 Chrysomphalus aurantii Mask.
Lonicera sp., CAPRIFOLIACEAE.
 Aspidiotus hederae (Vall.) Sign.
 Chrysomphalus aurantii Mask.
 Chrysomphalus rossi Mask.
 Howardia biclavis Comstock.
 Lecanium hesperidum Linn.
 Pseudococcus sp.
Loquat, see *Eriobotrya japonica*.
Lucerne, see *Medicago sativa*.
Lycium afrum (Linn.), SOLANACEAE.
 Pseudaonidia lycii Brain.
Macadamia ternifolia F. Meull., PROTEACEAE.
 Aspidiotus (*Morganella*) *maskelli* Comst.
 Chrysomphalus ficus Ashmead.
 Protopulvinaria piriformis (Ckll.)
Mackaya sp., ACANTHACEAE.
 Chrysomphalus aurantii Mask.
Maclura aurantiaca (Nott.), MORACEAE.
 Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Macrocarpa, see *Cupressus macrocarpa*.
Macrozamia sp., CYCADACEAE.
 Aspidiotus (*Selenaspidus*) *lounsburyi* Marlatt.
Magnolia, MAGNOLIACEAE.
 Aspidiotus hederae (Vall.) Sign.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.

- Chrysomphalus ficus* Ashmead.
Lecanium sp.
Pseudococcus virgatus Ckll.
 Mahogany, African, see *Khaya senegalensis*.
 Maidenhair-tree, see *Ginkgo biloba*.
Malva parviflora Linn., MALVACEAE.
 Pseudococcus capensis Brain.
Mangifera indica (Linn.), ANACARDIACEAE.
 Aspidiotus hederae (Vall.) Sign.
 Aspidiotus (Morganella) *maskelli* Ckll.
 Aspidiotus (Hemiberlesea) *rapax* Comst.
 Aspidiotus (Hemiberlesea) *lataniae* (Sign), Green.
 Chionaspis (Phenacaspis) *natalensis* Ckll.
 Chrysomphalus aurantii Mask.
 Chrysomphalus dictyoispermi Mask.
 Chrysomphalus ficus Ashmead.
 Diaspis (Aulacaspis) *pentagona* Targ.
 Pseudococcus virgatus Ckll.
 Mango, see *Mangifera indica*.
 Mangosteen, see *Garcinia mangostana* (Linn.)
 Maple, see *Acer*.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Diaspis boisduvali Sign.
 Diaspis bromeliae (Kerner).
Medicago sativa Linn., LEGUMINOSAE.
 Icerya purchasi Mask.
 Pseudococcus capensis Brain.
Melaleuca hypericifolia Sm., MYRTACEAE.
 Chrysomphalus aurantii Mask.
 Chrysomphalus rossi Mask.
Melia azaderach Linn., MELIACEAE.
 Ceroplastes destructor Newst.
 Chrysomphalus aurantii Mask.
 Diaspis (Aulacaspis) *fulleri* Ckll.
 Saissetia subpatelliforme Newst.
Mesembryanthemum edule Linn., AIZOACEAE.
 Aonidia mesembryanthemae Brain.
 Aspidiotus (Selanaspidus) *lounsburyi* Marlatt.
 Aspidiotus (Selanaspidus) *lounsburyi* var. Brain.

- Pseudococcus capensis* Brain.
Pulvinaria mesembryanthemi (Vall.) Sign.
Michelia champaca Linn., MAGNOLIACEAE.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (*Morganella*) *maskelli* Ckll.
Chrysomphalus ficus Ashmead.
Icerya seychellarum Westw.
Mimosa, see *Acacia karroo* Hayne.
Mimusops, SAPOTACEAE.
Aspidiotus (*Selenaspidus*) *pertusus* Brain.
Mimusops elengi.
Chrysomphalus dictyospermi Morg. (dark form).
Mistletoe, see *Viscum* sp.
Mock-orange, see *Philadelphus* sp.
Moonflower, see *Datura suaveoleus* Humb & Bonpl.
Morus nigra Linn., MORACEAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus aurantii Mask.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Icerya purchasi Mask.
Lecanium hesperidum Linn.
Pseudococcus citri Risso.
“M’sasa,” see *Brachystegia randii* (Baker).
Mulberry, see *Morus nigra*.
Muraltia heisteria D.C., POLYGALACEAE.
Pseudococcus muraltiae Brain.
Murraya sp., AURANTIACEAE.
Lepidosaphes pinniformis (Bche).
Musa sp., MUSACEAE.
Chrysomphalus ficus Ashmead.
Musa sapientum (Linn.), MUSACEAE.
Aspidiotus destructor Sign.
Chionaspis (*Phanacaspis*) *natalensis* Ckll.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Myrtle, see *Myrtus communis* Linn.
Myrtle (Australian), see *Leptospermum laevigatum*.
Myrtus communis Linn., MYRTACEAE.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.

- Icerya purchasi* Mask.
Lecanium hesperidum Linn.
Myrtus microphylla (Myrtacea).
Chrysomphalus dictyospermi Morg. (dark form).
 Natal plum, see *Carissa grandiflora*.
Neillia opulifolia Benth., ROSACEAE.
Aspidiotus (Hemiberlesea) *rapax* Comst.
Chrysomphalus aurantii Mask.
Nerium oleander Linn., APOCYNACEAE.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (Diaspidiotus) *pectinatus* Ldgr.
Asterolecanium pustulans Ckll.
Chrysomphalus aurantii Mask.
Chrysomphalus corticosus Brain.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.
Hemilecanium theobromæ Newst.
Pseudococcus burnerae Brain.
 New Zealand flax, see *Phormium tenax*.
Nierembergia sp., SOLANACEAE.
Chrysomphalus aurantii Mask.
Nopalea coccinellifera Salm-Dyck., CACTACEAE.
Coccus cacti Linn.
Coccus confusus capensis Green.
 Oak, see *Quercus pedunculata* A.D.C.,
Ochna sp., OCHNACEAE.
Ceroplastes eucleæ Brain.
Olea europæa Linn., OLEACEAE.
Aspidiotus (Hemiberlesea) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus corticosus Brain.
Saissetia oleæ Bernard.
Olea verrucosa Link., OLEACEAE.
Chrysomphalus corticosus Brain.
 Oleander, see *Nerium oleander*.
 Olive, see *Olea europæa* Linn.
 Olive, bastard, see *Chilianthus oleaceus*.
 Olive, wild, see *Olea verrucosa*.
Opuntia decumana Haw., CACTACEAE.
Coccus cacti Linn.

- Opuntia monocantha* Haw., CACTACEAE.
 Coccus confusus capensis Green.
 Coccus indicus Green.
Opuntia tomentosa Salm-Dyck., CACTACEAE.
 Coccus cacti Linn.
Opuntia sp., CACTACEAE.
 Diaspis echinocacti (Bouche).
 Orange, see *Citrus* spp.
 Orchids, ORCHIDACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Diaspis boisduvali Sign.
 Lecanium hesperidum Linn.
 Parlatoria pergandei Comst.
 Parlatoria proteus Curtis.
 Osage-orange, see *Maclura aurantiaca*.
Osmanthus sp., OLEACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
Oxalis cernua (Thunb.), OXALIDACEAE.
 Pseudococcus capensis Brain.
Paeonia sp., RANUNCULACEAE.
 Chrysomphalus aurantii Mask.
 Chrysomphalus rossi Mask.
 Palms, PALMACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (*Selenaspidus*) *silvaticus* Ldgr.
 Aspidiotus (*Hemiberlesea*) *lataniae* Sign. Green.
 Chionaspis (*Pehnacaspis*) *natalensis* Ckll.
 Chrysomphalus aurantii Mask.
 Chrysomphalus dictyospermi Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Diaspis boisduvalli Sign.
 Fiorinia fiorinae Targ.
 Icerya purchasi Mask.
 Icerya seychellarum Westw.
 Ischnaspis longirostris Sign.
 Lecanium hesperidum Linn.

- Pseudococcus adonidum* (Linn.), Westw.
Pseudococcus nipae Mask.
Pandanus sp., PANDANACEAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus aurantii Mask.
Chrysomphalus dictyospermi Mask.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.
Passerina ericoides L., THYMELAEACEAE.
Cerococcus passerinae Brain.
Passiflora quadrangularis Linn., PASSIFLORACEAE.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Pseudococcus burnerae Brain.
Pavetta sp., RUBIACEAE.
Ceroplastes eucleæ Brain.
Chrysomphalus rossi Mask.
Paw-paw, see *Carica papaya* Linn.
Peach, see *Prunus persica* Stokes.
Peach, wild, Cape, *Kiggelaria africana*.
Transvaal *Landolphia capensis*.
Pear, see *Pirus communis* Linn.
Pelargonium sp., GERANIACEAE.
Pentstemon, SCROPHLEARIACEAE.
Aspidiotus hederæ (Vall.) Sign.
Chrysomphalus aurantii Mask.
Peony, see *Paeonia* sp.
Pepper-tree, see *Schinus molle*.
Periwinkle, see *Vinca major* (Linn.)
Persea gratissima (Gaertn.), LAURACEAE.
Aspidiotus destructor Sign.
Aspidiotus transparent Green.
Ceroplastes destructor Newst.
Chrysomphalus aurantii Mask.
Chrysomphalus dictyospermi Morg.
Chrysomphalus ficus Ashmead.
Protopulvinaria piriformis (Ckll.) Lefroy.
Pseudococcus virgatus Ckll.
Saissetia perseæ Brain.
Persimmon, see *Diospyres kaki* Linn.
Petrea, VERBENACEAE.
Orthezia insignis Dougl.

- Philadelphus, PHILADELPHACEAE.
 Aspidiotus cyanophylli Sign.
- Phlox, POLEMONIACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
- Phormium tenax (Forst), LILIACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Aspidiotus (Selenaspidus) pumilis Brain.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Pseudococcus virgatus Ckll.
- Phragmites communis Trin., GRAMINEAE.
 Aspidiotus transparens Green.
- Phrynium sp., MARANTACEAE.
 Chrysomphalus ficus Ashmead.
- Physalis peruviana, SOLANACEAE.
 Aspidiotus hederæ (Vall.) Sign.
- Phytolacca dioica (Linn.), PHYTOLACCACEAE.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Chrysomphalus aurantii Mask.
 Pseudococcus capensis Brain.
- Pig Lily, see *Zantedeschia aethiopica*.
- Pineapple, see *Ananas sativus*.
- Pinus australis Dum-Cours., CONIFERAE.
 Chrysomphalus ficus Ashmead.
- Pinus canariensis C.Sm., CONIFERAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus rossi Mask.
 Monophlebus hirtus Brain.
- Pinus excelsa (Vall.), CONIFERAE.
 Aspidiotus hederæ (Vall.) Sign.
- Pinus halepensis (Mill.), CONIFERAE.
 Chrysomphalus rossi Mask.
- Pinus insignis (Dougl.), CONIFERAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus rossi Mask.
 Lecanium hesperidum (Linn.)
- Pinus pinaster (Soland), CONIFERAE.
 Chrysomphalus rossi Mask.

Pinus sp., indet., CONIFERAE.*Chrysomphalus aurantii* Mask.*Icerya purchasi* Mask.*Lecanium hesperidum minimum* (Linn.) Dougl.*Pirus communis* (Linn.), ROSACEAE.*Aspidiotus* (*Diaspidiotus*) *perniciosus* (Comst.)*Aspidiotus* (*Diaspidiotus*) *pectinatus* Ldgr.*Aspidiotus* (*Hemiberlesea*) *rapax* Comst.*Chrysomphalus aurantii* Mask.*Chrysomphalus rossi* Mask.*Chrysomphalus corticosus* Brain.*Diaspis* (*Aulacaspis*) *pentagona* Targ.*Icerya purchasi* Mask.*Pseudococcus capensis* Brain.*Pirus japonica* Thunb., ROSACEAE.*Aspidiotus* (*Diaspidiotus*) *pectinatus* Ldgr.*Chrysomphalus corticosus* Brain.*Pirus malus* Linn., ROSACEAE.*Aspidiotus* (*Diaspidiotus*) *perniciosus* Comst.*Aspidiotus* (*Diaspidiotus*) *forbesi* Johns.*Aspidiotus* (*Diaspidiotus*) *pectinatus* Ldgr.*Asterolecanium pustulans* Ckll.*Chrysomphalus aurantii* Mask.*Chrysomphalus corticosus* Brain.*Icerya purchasi* Mask.*Pseudococcus capensis* Brain.*Pittosporum undulatum* Vent., PITTOSPORACEAE.*Chrysomphalus aurantii* Mask.*Pittosporum* sp., PITTOSPORACEAE.*Aspidiotus* (*Diaspidiotus*) *pectinatus* Ldgr.*Icerya purchasi* Mask.*Plane*, see *Platanus acerifolia* (Willd.).*Platanus acerifolia* (Willd.), PLATANACEAE.*Aspidiotus* (*Morganella*) *maskelli* Ckll.*Aspidiotus* (*Hemiberlesea*) *rapax* Comst.*Chrysomphalus aurantii* Mask.*Chrysomphalus corticosus* Brain.*Chrysomphalus rossi* Mask.*Plectronia* sp., RUBIACEAE.*Aspidiotus* (*Diaspidiotus*) *pectinatus* Ldgr.*Chrysomphalus corticosus* Brain.

- Plum, see *Prunus domestica* Linn.
 Plum, Dog., see *Ekebergia capensis*.
 Plum, Kaffir, see *Harpephyllum caffrum*.
 Plum, Natal, see *Carissa grandiflora* or *Chrysophyllum natalense*.
 Plumbago, PLUMBAGINACEAE.
 Icerya purchasi Mask.
 Plumieria rubra (Linn.), APOCYNACEAE.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Protopulvinaria piriformis Ckll.
 Diaspis (*Aulacaspis*) *pentagona* Targ.
 Plumieria sp., indet., APOCYNACEAE.
 Aspidiotus destructor Sign.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus dictyospermi Morg.
 Podocarpus elongatus L'Herit., TAXACEAE.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Poinsettia, EUPHORBIACEAE.
 Chrysomphalus aurantii Mask.
 Chrysomphalus ficus Ashmead.
 Chrysomphalus rossi Mask.
 Diaspis (*Aulacaspis*) *pentagona* Targ.
 Howardia biclavis Comst.
 Icerya purchasi Mask.
 Pseudococcus virgatus Ckll.
 Pomegranate, see *Punica granatum*.
 Poplar, see *Populus* sp.
 Populus sp., SALICACEAE.
 Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
 Aspidiotus hederæ (Vall.) Sign.
 Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
 Chrysomphalus aurantii Mask.
 Chrysomphalus corticosus Brain.
 Chrysomphalus rossi Mask.
 Diaspis (*Aulacaspis*) *pentagona* Targ.
 Pride of India, see *Lagerstroemia indica* Linn.
 Privet, see *Ligustrum japonicum* Hort.

- Prosopis* sp., LEGUMINOSAE.
Icerya purchasi Mask.
Protea hirta (Klotzsch), PROTEACEAE.
Chionaspis (*Dinaspis*) *distincta* Leon.
Protea sp., PROTEACEAE.
Furcaspis proteae Brain.
Lecanium proteae Brain.
Prunus armeniaca Linn., ROSACEAE.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Daspis (*Aulacaspis*) *pentagona* Targ.
Prunus cerasus Linn., ROSACEAE.
Chrysomphalus aurantii Mask.
Prunus domestica Linn., ROSACEAE.
Aspidiotus (*Diaspidiotus*) *forbesi* Johnson.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus corticosus Brain.
Diaspis (*Aulacaspis*) *pentagona* Morg.
Prunus persica (Stokes), ROSACEAE.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus corticosus Brain.
Chrysomphalus dictyospermi Mask.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Aspidiotus hederæ (Vall.) Sign.
Pseudococcus capensis Brain.
Prunus pissardi Carr., ROSACEAE.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Psidium pyrifera Linn., MYRTACEAE.
Chrysomphalus aurantii Mask.
Chrysomphalus dictyospermi Mask.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Pseudococcus virgatus Ckll.
Pulvinaria psidii Mask.

Ptaeroxylon utile E. & Z., SAPINDACEAE.

Chrysomphalus aurantii Mask.

Pteris sp., POLYPODIACEAE.

Chionaspis (*Pinnaspis*) *aspidistrae* Sign.

Pterospermum sp., STERCULIACEAE.

Chrysomphalus dictyospermi Morg.

Chrysomphalus ficus Ashm.

Lecanium hesperidum Linn.

Pumpkins, see *Cucumis* sp.

Punica granatum Linn., PUNICACEAE.

Tachardia actinella Ckll. & King.

Quercus pedunculata A.D.C., CUPULIFERAE.

Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.

Aspidiotus (*Diaspidiotus*) *perniciocus* Comst.

Aspidiotus hederæ (Vall.) Sign.

Aspidiotus (*Hemiberlesea*) *rapax* Comst.

Asterolecanium variolosum Ratz.

Chrysomphalus aurantii Mask.

Chrysomphalus rossi Mask.

Icerya purchasi Mask.

Quercus sp., CUPULIFERAE.

Asterolecanium variolosum Ratz.

Chrysomphalus aurantii Mask.

Chrysomphalus dictyospermi Morg.

Quick grass, see *Cynodon* sp.

Quince, see *Cydonia vulgaris* Pers.

Raphiolepis sp., ROSACEAE.

Chrysomphalus aurantii Mask.

Chrysomphalus ficus Ashmead.

Howardia biclavis Comst.

Red Clover, see *Trifolium pratense* Linn.

Reed, see *Phragmites communis* (Trin.)

Resin bush, see *Harpaxisbos*.

Rhamnus frangula Linn., RHAMNACEAE.

Chrysomphalus aurantii Mask.

Rhamnus sp., RHAMNACEAE.

Chrysomphalus aurantii Mask.

Rhenosterbos, see *Elytropappus rhinocerotis* Less.

Rhodesian Lemon Grass (*Elionurus* sp.?), GRAMINAE.

Chionaspis stanotophri Cooley.

- Rhododendron sp., ERICACEAE.
 Chrysomphalus aurantii Mask.
 Rhus lancea Linn., ANACARDIACEAE.
 Chionaspis mytilaspiformis Newst.
 Gymnaspis faurei Brain.
 Rhus thunbergii (Hook), ANACARDIACEAE.
 Chionaspis (Phenacaspis) lounsburyi Cooley.
 Rhus sp. indet., ANACARDIACEAE.
 Aonidia badia Brain.
 Aonidia marginalis Brain.
 Aonidia rhusae Brain.
 Aspidiotus (Diaspidiotus) pectinatus Ldgr.
 Ceroplastes quadrilineatus Newst. var. simplex Brain.
 Chrysomphalus aurantii Mask.
 Chrysomphalus corticosus Brain.
 Diaspis rhusae Brain.
 Gymnaspis faurei Brain.
 Rhynchospermum sp., COMPOSITAE.
 Chrysomphalus ficus Ashmead.
 Ribes sp., GROSSULARIACEAE.
 Chrysomphalus aurantii Mask.
 Chrysomphalus corticosus Brain.
 Richardia africana Kunth., see Zantedeschia (Araceae).
 Ricinus communis (Linn.), EUPHORBIACEAE.
 Chrysomphalus aurantii Mask.
 Diaspis (Aulacaspis) fulleri Ckll.
 Diaspis (Aulacaspis) pentagona Targ.
 Robinia pseudacacia L. LEGUMINOSAE.
 Aspidiotus (Diaspidiotus) africanus (Marlatt) Brain.
 Aspidiotus (Diaspidiotus) pectinatus Ldgr.
 Aspidiotus (Hemiberlesea) rapax Comst.
 Chrysomphalus aurantii Mask.
 Chrysomphalus corticosus Brain.
 Pseudococcus capensis Brain.
 Rosa multiflora Thunb., ROSACEAE.
 Chrysomphalus corticosus Brain.
 Chrysomphalus rossi Mask.
 Rosa sp., ROSACEAE.
 Aspidiotus (Diaspidiotus) perniciosus Comst.
 Aspidiotus (Hemiberlesea) lataniae Sign. Green.
 Aspidiotus hederæ (Vall.) Sign.

- Chrysomphalus aurantii Mask.
- Chrysomphalus dictyospermi Mask.
- Chrysomphalus ficus Ashmead.
- Chrysomphalus rossi Mask.
- Icerya purchasi Mask.
- Icerya seychellarum Westw.
- Rose, see *Rosa* sp.
- Rosemary, see *Rosmarinus officinalis*.
- Rosmarinus officinalis* Linn., LABIATAE.
 - Icerya purchasi Mask.
- Royena lyciodes* Desf., EBENACEAE.
 - Howardia biclavis Comst.
- Royena pallens* (Thunb.), EBENACEAE.
 - Cerococcus royenae Brain.
 - Chrysomphalus ficus Ashmead.
- Ruellia* sp., ACANTHACEAE.
 - Orthezia insignis Dougl.
- Saccharum officinarum* Linn., GRAMINEAE.
 - Aspidiotus destructor Sign.
 - Pseudococcus sacchari Ckll.
- Salisburia, see *Ginkgo*.
- Salix* sp., SALICACEAE.
 - Aspidiotus (*Diaspidiotus*) pectinatus Ldgr.
 - Aspidiotus (*Diaspidiotus*) perniciosus Comst.
 - Chionaspis (*Poliaspis*) kiggelariae Brain.
 - Chrysomphalus aurantii Mask.
 - Diaspis newsteadi Leon.
- Salvia* sp., LABIATAE.
 - Chrysomphalus aurantii Mask.
 - Icerya purchasi Mask.
- Salvia runcinata* Linn., LABIATAE.
 - Pseudococcus transvaalensis Brain.
- Sambucus* sp., CAPRIFOLIACEAE.
 - Chrysomphalus aurantii Mask.
- Schinus molle* Linn., ANACARDIACEAE.
 - Aspidiotus africanus Marlatt.
 - Aspidiotus (*Diaspidiotus*) pectinatus Ldgr.
 - Aspidiotus (*Diaspidiotus*) perniciosus Comst.
 - Aspidiotus (*Hemiberlesea*) rapax Comst.
 - Aspidiotus hederæ (Vall.) Sign.

- Chrysomphalus aurantii* Mask.
Chrysomphalus corticosus Brain.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Icerya purchasi Mask.
Schotia sp., LEGUMINOSAE.
Chrysomphalus rossi Mask.
Scirpus nodedus (Rottb.), CYPERACEAE.
Chrysomphalus ficus Ashmead.
Scutia indica (Brongn.), RHAMNACEAE.
Chionaspis scutiae Brain.
Seaforthia sp. PALMAE.
Chrysomphalus corticosus Brain.
Senebiera coronopus Poir, CRUCIFERAE.
Pseudococcus capensis Brain.
Senecio vulgaris Linn., COMPOSITAE.
Pseudococcus capensis Brain.
Scolopia sp., FLACOURTIACEAE.
Chrysomphalus aurantii Mask.
Sesbania sp., LEGUMINOSAE.
Chrysomphalus aurantii Mask.
Sida rhombifolia Linn., MALVACEAE.
Pseudococcus burnerae Brain.
Pseudococcus virgatus Ckll.
Silene gallica Linn., CARYOPHYLLACEAE.
Pseudococcus capensis Brain.
 Silver leaf tree, see *Leucadendron argenteum*.
 Silver Wattle, see *Acacia dealbata*.
Smilax, SMILACEAE.
Chrysomphalus ficus Ashmead.
 Sneezewood, see *Ptaeroxylon utile*.
Solanum sp., SOLANACEAE.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus corticosus Brain.
Pulvinaria floccifera Westw.
Solanum giganteum Jacq., SOLANACEAE.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Solanum sodomaeum Linn., SOLANACEAE.
Pseudococcus capensis Brain.
Sonchus oleraceus Linn., COMPOSITAE.
Pseudococcus capensis Brain.

- Sophora* sp., LEGUMINOSAE.
Chrysomphalus aurantii Mask.
 Spanish sulla, see *Hedysarum coronarium*.
Spergula arvensis Linn., CARYOPHYLLACEAE.
Pseudococcus capensis Brain.
Sphaerosicyos sphaerica (Gourd.) CUCURBITACEAE.
C. (Phenacaspis) natalensis Ckll.
Spielmannia sp., VERBENACEAE.
Aspidiotus (Diaspidiotus) pectinatus Ldgr.
Spiraea spp., ROSACEAE.
Aspidiotus (Diaspidiotus) pectinatus Ldgr.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (Hemiberlesea) rapax Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus corticosus Brain.
Sporobolus indicus R.Br., GRAMINEAE.
Pseudococcus natalensis Mask.
 Stamvrugte (Stemfruit), see *Chrysophyllum magaliesmontanum*.
Stenotaphrum glabrum, GRAMINEAE.
Chionaspis stanotophri Cooley.
Stapelia sp., ASCEPIADACEAE.
Asterolecanium stentæ Brain.
 Star apple, see *Royena lycioides* Deef.
Statice sp., PLUMBAGINACEAE.
Chrysomphalus aurantii Mask.
 Stemfruit, see *Chrysophyllum magaliesmontanum*.
Stephanotis, ASCLEPIADACEAE.
Lecanium hesperidum Linn.
Pseudococcus burnerae Brain.
Sterculia acerifolia A. Cunn., STERCULIACEAE.
Chrysomphalus rossi Mask.
Sterculia sp., STERCULIACEAE.
Aspidiotus (Hemiberlesea) rapax Comst.
Chrysomphalus aurantii Mask.
Diaspis (Aulacaspis) pentagona Targ.
 Strawberry, see *Fragaria*.
Strelitzia reginae (Banks) Ait., MUSACEAE.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.

- Strelitzia* sp., MUSACEAE.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
 Chrysomphalus aurantii Mask.
 Diaspis (*Aulacaspis*) *pentagona* Targ.
 Sugar bush, see *Protea* spp.
 Sugar-cane, see *Saccharum officinarum*.
 Sugar Maple, see *Acer saccharinum*.
 Sweetpea, see *Lathyrus odoratus* Linn.
 Sweet potato.
 Pseudococcus transvaalensis Brain.
 Sunflower, see *Helianthus*.
 Taaibos, see *Rhus* spp.
Tabernaemontana sp., APOCYNACEAE.
 Chrysomphalus aurantii Mask.
 Tamarind, see *Tamarindus indica*.
Tamarindus indica (Linn.), LEGUMINOSAE.
 Chrysomphalus corticosus Brain.
 Chrysomphalus ficus Ashmead.
 Tamarisk, see *Tamarix*.
Tamarix sp., TAMARICACEAE.
 Puto (?) *africanus* Brain.
Taxodium sp., CONIFERAE.
 Chrysomphalus aurantii Mask.
 Tea, see *Thea*.
Tecoma smithii Hort., BIGNONIACEAE.
 Aspidiotus (*Morganella*) *maskelli* Ckll.
Tecoma sp., BIGNONIACEAE.
 Aspidiotus hederæ (Vall.) Sign.
 Diaspis (*Aulacaspis*) *pentagona* Targ.
Terminalia sp., COMBRETACEAE.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Thea sp., THEACEAE.
 Aspidiotus (*Selanaspidus*) *silvaticus* Ldgr.
Thevetia sp., APOCYNACEAE.
 Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Thuya orientalis Linn., CONIFERAE.
 Aspidiotus hederæ (Vall.) Sign.
 Chrysomphalus aurantii Mask.
 Thorn tree, see *Acacia karroo* Hayne.
Thunbergia erecta T. Anders, ACANTHACEAE.
 Orthezia insignis Dougl.

- Tondo or Tzonto, see *Brachystegia spicaeformis* (Portuguese East Africa).
- Toxicophlaea sp., APOCYNACEAE.
Chrysomphalus aurantii Mask.
- Trema bracteolata Blume (Urticaceae).
Chrysomphalus dictyospermi Morg. (dark form).
- Trichilia sp., MELIACEAE.
Chrysomphalus aurantii Mask.
Howardia biclavis Comst.
Ischnaspis longirostris Sign.
Pseudococcus trichiliae Brain.
Pulvinaria jacksoni Newst.
- Trichocladus sp., HAMAMELIDACEAE.
Chrysomphalus aurantii Mask.
- Trifolium pratense (Linn.), LEGUMINOSAE.
Pseudococcus capensis Brain.
- Tristania sp., MYRTACEAE.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Chrysomphalus rossi Mask.
- Tristania conferta R.Br., MYRTACEAE.
Chrysomphalus corticosus Brain.
- Ulex europaeus Linn., LEGUMINOSAE.
Aspidiotus (Hemiberlesea) *rapax* Comst.
- Ulmus sp., ULMACEAE.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
- Verbena, VERBENACEAE.
Icerya purchasi Mask.
Orthezia insignis.
- Veronica, SCROPHULARIACEAE.
Aspidiotus hederæ (Vall.) Sign.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Aspidiotus (Hemiberlesea) *rapax* Comst.
Chrysomphalus aurantii Mask.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Icerya purchasi Mask.
- Viburnum sp., CAPRIFOLIACEAE.
Aspidiotus (Hemiberlesea) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus rossi Mask.

- Icerya purchasi* Mask.
Pseudococcus burnerae Brain.
Vinca major Linn., APOCYNACEAE.
Aspidiotus hederae (Vall.) Sign.
Chrysomphalus aurantii Mask.
Chrysomphalus ficus Ashmead.
Virgilia capensis Lam., LEGUMINOSAE.
Chrysomphalus corticosus Brain.
Vitis vinifera (Linn.), VITACEAE.
Aspidiotus hederae (Vall.) Sign.
Aspidiotus (*Diaspidiotus*) *pectinatus* Ldgr.
Aspidiotus (*Diaspidiotus*) *perniciosus* Comst.
Aspidiotus (*Hemiberlesea*) *lataniae* Sign. Green.
Chrysomphalus aurantii Mask.
Chrysomphalus dictyospermi Morg. (yellow form).
Chrysomphalus rossi Mask.
Cryptinglisia lounsburyi Ckll.
Diaspis (*Aulacaspis*) *pentagona* Targ.
Icerya purchasi Mask.
Margarodes capensis (Giard.) Brain.
Margarodes greeni Brain.
Pseudococcus capensis Brain.
Saissetia oculata Brain.
Wachendorfia paniculata Linn., LILIACEAE.
Pseudococcus wachendorffiae Brain.
Wacht-een-beetje, see *Acacia caffra* Willd.
Walnut, see *Juglans regia*.
White Pear, see *Apodytes dimidiata* E. Mey.
Willow, see *Salix*.
Wistaria sp., LEGUMINOSAE.
Chrysomphalus aurantii Mask.
Icerya purchasi Mask.
Lecanium wistariae Brain.
Wit-gat-boom, see *Capparis albitrunca*.
Yellowwood, see *Podocarpus* sp.
Yucca sp., LILIACEAE.
Aspidiotus hedrae (Vall.) Sign.
Aspidiotus (*Hemiberlesea*) *rapax* Comst.
Chrysomphalus aurantii Mask.
Chrysomphalus rossi Mask.

Zinnia sp., COMPOSITAE.

Chrysomphalus aurantii Mask.

Zephyrantes sp., AMARYLLIDACEAE.

Chrysomphalus ficus Ashmead.

Zantedeschia aethiopica Spreng., ARACEAE.

Pseudococcus capensis Brain.

Zizyphus sp., RHAMNACEAE.

Inglisia zizyphi Brain.

Preliminary Note on the Adaptation of Certain Radio Principles to Insect Investigation Work.

BY

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While planning a series of investigations of insect sounds, to include those of the " termite stridulation type " which are outside the human audibility range, the writer has had to adapt many of the principles which underlie the ordinary radio or wireless practices. One aspect of the matter, which promises to be of considerable economic importance, forms the subject of the present preliminary note.

Starting with ordinary, audible, mechanical sounds, an apparatus was constructed to convert such sounds into electric currents, to amplify them, and then reproduce them in headphones or loud-speaker. With ordinary present-day equipment this is a straightforward matter, and was accomplished with Skinderviken microphone buttons, three in series, linked to an ordinary audio-frequency amplifier through a transformer. The present coupling is through a Burndept Public Address Unit which simplifies matters by controlling the amount of current which passes through the microphones. The success of the apparatus naturally depends on the sensitiveness of the microphone, the exclusion of external sounds, the avoidance of loss of delicate microphone currents, and a silent amplifier.

Transformer coupling was tried in the amplifier used, and was sufficiently silent to demonstrate the possibilities of such an apparatus, but a " power " amplifier or one with several stages of resistance coupling might give better results. It is felt, how-

ever, that the amplification is a simple matter and the whole success or failure of the arrangement centres upon the microphone and its surroundings.

In the preliminary tests the microphone buttons were mounted on a very thin sheet of hardwood slotted into one end of a box which is isolated from outside vibration by thick felt. The whole box is enclosed within a larger one, of which the lid is also felt-lined, and from which the very thin (34 d.c.c.) wires lead to the coupler.

The amplifier is home-made with three large-sized transformers said to be 5 to 1, 3 to 1 and 3 to 1 ratios. It is fitted with two pairs of out-put terminals, one with telephone transformer and the other without, 120 ohm headphones and 2,000 ohm loud speaker are used.

The first tests were made with a small wrist watch, the tick of which was intensified to sufficient loudness through a loud speaker to be audible across a large room. Two portions of apple tree stem, about one inch in diameter, infested with the larvae of the apple and quince borer (*C. tristis*), were then placed in the box in contact with the partition carrying the microphones, and through the headphones the movements of the larvae could be heard distinctly and the gnawing readily recognised.

The presence of weevils (*C. oryzae*, etc.), in grain and in yeast cakes has likewise been detected, and attempts are being made to secure a microphone which is sufficiently sensitive to extend the usefulness of the apparatus so that it may be used for the detection of insect larvae in fruit, etc. If this can be accomplished it will have an important bearing on the selection of fruit for export; the testing of seeds for bruchids, weevils, etc.

It is not necessary to emphasize the importance of being able to determine the presence or absence of fruit pests in export fruit. A reference to the Journal of the Department of Agriculture of the Union of South Africa of May, 1923, which contains "Excerpts from Official Statement by United States Department of Agriculture, issued with Notice of Hearing to consider Advisability of excluding Fruit and Vegetables from Countries where Fruit-Flies are Pests," demonstrates its application to South African fruit-growers.

The only attempt which has been made in this matter came from Mr. C. W. Mally, M.Sc., Senior Entomologist of the Division of Entomology.

In the "South African Fruit-Grower" of June 20th, 1923, he published illustrations of peach and pear to show that by means of X-ray photographs the presence of fruit-fly or codling moth might, under favourable conditions, be demonstrated.

The results of further investigations in this subject will be published as the work is completed, but the subject is considered to offer such important possibilities that this preliminary note is published to bring it to the notice of other workers along the same line.

9th June, 1924.

The Eriospermums of the Stellenbosch Flats.

BY

A. V. DUTHIE.

The genus *Eriospermum* belonging to the family Liliaceae is sharply distinguished from allied genera by the possession of a tuberous 'root-stock' and woolly seeds. Some 70 species have been described of which the majority occur in South Africa and the remainder in Tropical Africa. The genus, both as regards species and individuals, is well represented in the Stellenbosch flora, but an attempt to identify the plants specifically with the aid of the *Flora Capensis* met with so little success that it seemed advisable to make a detailed study of the local forms. The results embodied in this paper have been obtained from the study of large numbers of living plants in their natural habitats, supplemented by the study of tubers removed from the flats and grown in the garden. I have pleasure in acknowledging my indebtedness to Mrs. Bolus and the staff of the Bolus Herbarium for facilities for the examination of type specimens and literature as well as for valuable information concerning the Peninsula species; and to Dr. Marloth who has kindly placed his dried plants at my disposal. The specimens in the Government Herbarium in Cape Town have also been consulted. Miss Eleanor Dowson, B.Sc., has assisted me in making numerous observations in the field.

On the whole the genus is rather scantily represented in South African herbaria, the incompleteness of many of the specimens being due to the fact that the plants, as a rule, flower and leaf at different times. As species often grow intermixed in the same spot the possibility of associating leaf and inflorescence of different plants is one that has to be carefully guarded against. The tubers, which have proved to be of much systematic value, are often unrepresented on the herbarium sheets or else occur in a mutilated condition. Difficulty has been experienced in identifying some of the species owing to the brief and unsatis-

factory descriptions in the standard works and the incompleteness of some of the type specimens even when these are available for study in South Africa.

In working on this genus it is impossible to overestimate the importance of a study of the entire plant, including the tuber, and an examination of a large range of specimens in each species. Ten distinct species and varieties occur on the Stellenbosch Flats of which four have not hitherto been described. The abundance of the material available for examination has made it possible to add much detail to the descriptions of several well known species.

The results obtained may be summarised as follows :—

Tubers. The tubers differ much in size and shape even within the limits of a single species but two distinct types are represented in the specimens studied— a) the spherical or globose tuber with the growing point situated in the middle of the upper surface and b) the pear-shaped tuber with the growing point inserted at the broader end. The globose tuber is found in *E. parvifolium*, *E. spirale* and *E. confertum* (Pl. IV., figs. 1, 2; Pl. V., figs. 1-3, 8, 9.) No instances of branching have been noted in these spherical tubers but a few old plants of *E. parvifolium* have been found to possess two growing points (Pl. IV., fig 2), a condition which might eventually lead to a forking of the original tuber. Jacquin* figures a large tuber of *E. parvifolium* bearing two inflorescence axes. The pear-shaped tuber which is characteristic of young plants of the remaining species may have its long axis horizontal, vertical or inclined (Pl. I., fig. 1; II. figs. 1, 2; Pl. VI. 1, 9.) In older plants branching often occurs and the original shape may be more or less completely lost as growth proceeds. Vegetative reproduction is frequently met with in tubers of this type, the most extensive occurring in *E. cernuum* where in addition to forking small button-like lateral buds form on the surface of the tuber (Pl. II., figs. 1, 2, 5, 6). In *E. pubescens* and *E. lanceaefolium* the root bases are sometimes much enlarged and give a rough, tuberculate appearance to the tuber (Pl. I., fig 2). The smallest tubers occur in *E. spirale* and *E. confertum* where inflorescences are often developed from tubers only 4-5 mm. in diam. The tubers of *E. pubescens* on the other hand may reach a breadth of 11 cm. and a weight of over half a pound. The tuber flesh is white in *E. parvifolium* and

*Ic. t. 422.

E. cernuum, whitish or very pale pink in *E. fasciculatum* and often beetroot-red in the older parts of *E. lanceaefolium* and *E. pubescens*. The fleshy tubers contain a large quantity of mucilage but no starch or solid protein.

Leaves. All the local species of *Eriospermum* flower in the first half of the year, the leaves appearing as a rule after the fruits have matured. The interval between flowering and leafing is sometimes a long one. Juvenile tubers which have not reached the flowering age often develop leaves in advance of tubers which have been temporarily exhausted by the formation of flowers and fruit. The leaves of most species remain fresh and green until they are caught by the drought of early summer. An unbranched tuber usually produces a single leaf each season. The hollow base of the petiole ensheaths the growing point and is surrounded by the dried and often frayed remains of the sheaths of former years. The length of the petiole depends largely on the depth of the tuber in the soil and the intensity of illumination to which the blade is exposed. The shape of the lamina varies greatly in the different species being acicular in *E. spirale* and *E. confertum*, linear in *E. graminifolium*, lanceolate in *E. lanceaefolium* and ovate or cordate-orbicular in *E. pubescens*. The largest leaves are those of *E. pubescens* which may reach a breadth of 18 cm. They are very conspicuous objects on the Stellenbosch Flats and are known locally as 'perekloue' or 'bob-bejaansore'. In *E. spirale* and *E. confertum* var. *aureum* the upper part of the peduncle and the whole of the pedicels are green and persist after the fruits have been shed, forming a far more efficient photosynthetic organ than the leaf itself. The anatomy of these cylindrical organs does not differ essentially from that of the centric leaf. In *E. spirale* fully developed foliage leaves have only been observed in juvenile plants (Pl. V. fig. 3). A yet more interesting mode of increase of the photosynthetic system is by the development of facial processes as in *E. fasciculatum* (Pl. VI. fig. 2.) These processes, which arise from the upper surface of the lamina, are provided with numerous stomata.

Pubescence. The leaves of certain species such as *E. spirale*, *E. confertum*, *E. graminifolium* and *E. cernuum* are, so far as my observations go, entirely glabrous. *E. lanceaefolium* is typically glabrous but specimens are occasionally found which show some hairiness at the base or on the under surface of the leaf. It is possible that these are the result of crossing with

- ✓ *E. pubescens* but experiment only can decide this point. *E. parvifolium* and *E. fasciculatum* usually show a hairy petiole while the lamina of *E. fasciculatum* is ciliate and the facial processes more or less hairy. In *E. pubescens* the hairiness of the lamina varies so greatly that were it not for connecting forms the extremes might be readily mistaken for distinct species.

Inflorescence. The inflorescence throughout the genus is a simple raceme, each pedicel arising singly from the axil of a minute bract. The length of the peduncle and pedicels, number of flowers to a raceme and general form of the inflorescence varies greatly often within the limits of a single species. Racemes with secund, distichous and spreading pedicels sometimes occur in one and the same species. Thus the inflorescence characters are quite unsuitable for use as a basis of classification.

Flowers. Two main types of perianth have been noted— a) that with lobes equal or sub-equal, spreading like a star in fully opened flowers (Pl. III. fig. 3; V. fig. 12); b) that in which the inner perianth lobes are markedly broader than the outer, somewhat conduplicate at the tip and more or less erect and connivent, while the outer spread widely (Pl. I. fig. 2). The flowers of some species open fully for only three or four hours during the hottest part of the day. *E. confertum*, var. *aureum* is the only local form with yellow flowers, The differences in colour often observed in the keels of perianth lobes are due to variations in the distribution of chlorophyll and anthocyanin-containing cells. The dull brownish or greenish tint of some inflorescences is due to the same cause.

The filaments of the stamens are lanceolate (Pl. I. fig. 4, 9) or filiform (Pl. III. 4; IV. 5.) In colour the filaments vary from orange to white.

The ovary is globose (Pl. I. figs. 5, 10) or more or less cylindric (Pl. IV. fig. 6). The capsules have all three loculi equally developed or one or two partially or entirely suppressed. The seed hairs are white or whitish but they often discolour and become brown with age.

Pollination. The flowers of none of the local species are very showy though the yellow stars of *E. confertum* var. *aureum* and the white blooms of *E. cernuum* are conspicuous when fully open. Most seem devoid of scent; *E. pubescens* has a slight fruity odour which is more pronounced towards evening. The range of visiting insects is large and the percentage of fruits

matured high. Several species are more conspicuous in the fruiting than in the flowering stage and the hairy seeds are readily distributed by the wind.

Fungus parasites. The leaves of *E. pubescens* are often attacked by *Uromyces Eriospermum* and *Tubercinia Eriospermi*. Other species frequently attacked by *Uromyces* are *E. parvifolium* and *E. graminifolium*. All the remaining species appear to be immune but how far this apparent immunity is real or accidental can only be decided by experiment, a piece of work which Mr. L. Verwoerd hopes to undertake during the coming year.

Key to species which occur on the Stellenbosch Flats.

I. Leaf without facial processes :

- | | |
|--|--------------------------|
| (a) Lamina cordate-orbicular, or cordate-ovate, 5-18 cm. wide. | |
| Leaf more or less conspicuously pubescent, upper surface dark green. | 1 pubescens. |
| Leaf glabrous or glabrescent, pale green. | 2 pubescens var. ? |
| (b) Lamina oblong, lanceolate or ovate; 3 mm.-5 cm. wide. | |
| Leaf glabrous, unbranched tuber pear-shaped. | |
| Filaments broadly lanceolate | 3 lanceaefolium. |
| Filaments filiform | 4 cernuum. |
| Upper part of petiole usually hairy, tuber globose or spherical. | 5 parvifolium. |
| (c) Lamina linear | 6 graminifolium. |
| (d) Lamina acicular; peduncle spirally twisted. | |
| Peduncle abruptly thickened below the lowest pedicel; flowers white | 7 spirale. |
| Peduncle not thickening abruptly; flowers yellow | 8 confertum var. aureum. |

II. Leaf with facial processes :

- | | |
|--|-----------------|
| Lamina small, 2-5 mm. broad, with
tuft of cylindrical processes at
base | 9 fasciculatum. |
| Lamina $1\frac{1}{2}$ — $6\frac{1}{2}$ cm. long, bearing
scattered, cylindrical processes
on upper surface | 10 sp. |

E. pubescens, Jacq. *E. lanuginosum*, Jacq. and *E. latifolium*, Jacq. do not appear to differ in any essential feature. They agree in possessing large, red-fleshed tubers, many-flowered racemes with elongated spreading pedicels, lanceolate filaments, large leaves with indications of transverse veining and conspicuously channelled petioles. The differences in pedicel length, leaf shape and hairiness figured by Jacquin seem insufficient for separating species.

For convenience the name *E. pubescens* is used provisionally for the largest and most striking species occurring on the Stellenbosch Flats. It is the first to flower, the racemes which are usually large and dull-coloured being abundant during February and March. A moderate sized tuber and certain floral details are figured in Plate I. Early in April the hairy leaves begin to appear above the surface of the soil. The margins of the young leaves are conspicuously involute and the under surface is usually hairy and of a purplish colour. The lamina of the adult leaf as found growing in open, sandy places is usually cordate-orbicular or cordate-ovate in form, dark green above, purplish and hairy below with the margin adpressed to the ground. Numerous variations occur in the size, shape, position, colour and hairiness of the lamina and the length of the petiole, depending largely upon the habitat, more especially the intensity of illumination. The excellent photograph by Dr. Marloth in 'Das Kapland,' p. 315 which is labelled *Eriospermum latifolium*, Jacq. seems to be the typical Stellenbosch plant.

What appears to be a distinct variety of *E. pubescens* occurs abundantly in more clayey soil, occasionally intermixed with *E. pubescens* but more often alone. It differs from *E. pubescens* as described above in the somewhat smaller and more delicate inflorescences and paler, glabrescent leaves. The inflorescences appear later than those of *E. pubescens* and the interval between flowering and leafing is longer.

Further study of material from other parts is required before it is possible to make any definite statement on the validity or limits of Jacquin's species.

E. lanceaefolium, (Jacq. Collect. Suppl. 74; Ic. t. 421); tuber large, $2\frac{1}{2}$ — $7\frac{1}{2}$ cm. long, with reddish flesh and many wiry root fibres, usually unbranched; leaf solitary, produced after the flower; lamina lanceolate or oblong-lanceolate, 10—22 cm. long, 1—5 cm. broad, usually entirely glabrous, somewhat glaucous in colour, narrowed below into a petiole 4—16 cm. long which is often finely mottled with red and surrounded by the membranous sheaths of old leaves; peduncle terete, 34—75 cm. long, with a single rigid bracteal leaf at base; raceme 6—23 cm. long, usually more or less secund or spreading, 9—42 flrd.; flowers sessile, sub-sessile or pedicellate; pedicels erect or ascending, varying much in length even in the same inflorescence, sometimes reaching the length of 2 cm.; bracts minute, deltoid, 1—2 mm. long; perianth campanulate, 4—6 mm. long; segments concave, outer 4—6 mm. long, 2—3 mm. broad, brownish in colour, the colour spreading from the keel to near the margin, inner 4—5 mm. long, 3—4 mm. broad, with a wide green or brown keel; filaments broadly lanceolate, arched, usually white, about 2 mm. long and 1 mm. broad; style about as long as the globose ovary; hairs of seed white, turning brownish with age.

Sandy places on flats, often in shade of pine trees, locally abundant; flowering March—April.

The unbranched, adult tuber is more or less pear-shaped with the growing point at the broader end, though the form varies somewhat with age, position of tuber in soil, etc. The entire surface is often tubercled with the enlarged bases of the roots (Pl. I. fig. 6) while the side against which the leaf-base lies is usually distinctly grooved. Old tubers may lobe more or less freely producing several growing points.

Though the entire leaf is glabrous in the great majority of specimens examined, leaves which appear to be intermediate between *E. lanceaefolium* and *E. pubescens* in form, colour, veining and hairiness are occasionally met with. It is possible that these may be the result of crossing with *E. pubescens*. The variation in the length of the pedicels is well shown in Jacquin's excellent illustration.* In fruiting specimens the

*Ic. t. 421.

pedicels have been observed to reach the length of 3 cm. Not only may the length of pedicels of a single inflorescence vary—the lowest not always being the longest—but the intervals between the insertion of consecutive flowers may also vary. The bracts are occasionally adnate to the pedicel for some distance. (Pl. I. fig. 11). A good photograph of *E. lanceaefolium* is given in Marloth's Flora of South Africa Vol. IV. p. 104.

E. cernuum, Baker; tuber small, 1 to about 4 cm. long, more or less pyriform, simple or lobed, with white flesh and numerous root fibres; longer axis of tuber horizontal, inclined or vertical; growing point inserted at broader end; leaves produced after the flower, one or more to each tuber; blade vertical, ovate, oblong or oblong-lanceolate, glabrous, dark green, sometimes red margined, firm in texture, with immersed parallel veins; 1—5 cm. long, $\frac{1}{2}$ —2 cm. broad, narrowed below into a slender petiole 1—3 times the length of the blade; peduncle very slender, glabrous, 6—26 cm. long, straight or flexuose; raceme 1—8 cm. long, 2—18 fldr.; flrs. usually secund, occasionally more or less distichous; bracts minute; lower pedicels varying from 2—12 mm. in different inflorescences; open flower about 1 cm. across; outer perianth lobes oblong, often tinged with pink on the under side, keeled with green or red, 4—5 mm. long, 2—3 mm. broad; inner lobes white with narrow, green keel, 5 mm. long, 3—4 $\frac{1}{2}$ mm. broad; stamens about half as long as the perianth segments; filaments filiform; style a little longer than the globose ovary; capsule about 4 mm. long, before dehiscence almost completely hidden by the erect perianth lobes; seeds small, 1 $\frac{1}{2}$ —2 mm. long, covered with whitish hairs.

Stellenbosch Flats, locally abundant; flowering March—May.

Baker's type specimens of this species in the Bolus Herbarium were all collected in the Cape Peninsula. Of these Herb. Bolus 7238 is undoubtedly the same as the Stellenbosch plant; Schlechter 427 is probably the same as the Stellenbosch plant but the specimens are very imperfect and the leaves are wanting, while Schlechter 456 suggests a stunted form of *E. parvifolium*. Mounted on the same sheet as Schlechter's 456 are a number of stunted specimens of *E. parvifolium*, while with Schlechter's 427 are mounted several leaves and inflorescences which probably belong to *E. lanceaefolium*.

The vegetative organs of this species vary considerably with the habitat. In compact, clayey soil the tubers are usually simple and bear a single small leaf, while in more sandy ground among stones the tubers lobe freely, in extreme cases producing as many as eight leaves to a single plant. During the rainy season the soil in which *E. cernuum* grows is usually water logged while in the summer it is baked hard.

The skin of the tuber is whitish or pale brown, often with darker mottling. The vertical lamina is somewhat fleshy in texture and varies much in size and shape. The leaf margin is slightly involute at base where the blade narrows more or less abruptly into the grooved petiole. The lower half of the petiole is closely invested by the brown and membranous remains of the old leaf sheaths. Tubers which were removed from the flats to the garden and grown in a shady spot produced markedly longer and thinner leaf blades. Some of the leaves exhibit a fine parallel veining in the lower part of the lamina.

The inflorescences vary much in form; numerous instances have been noted of a curling of the apex of the inflorescence giving a decidedly 'cernuous' appearance to the raceme (Pl. III. fig. 2.)

The flowers which are among the most showy of the Stelenbosch species open widely during the hottest part of the day, the perianth lobes spreading in the form of a star. The species is very abundant in certain spots. During the flowering season one hundred inflorescences were counted in a circle of three ft. radius, while in marshy soil where the tubers were branching freely a single sod of earth some four inches square produced over sixty leaves.

E. parvifolium, (Jacq. Collect. Suppl. 74; Ic. t. 422); tuber spherical or globose, 8 mm.—2½ cm. in diam., flesh white; growing point apical; leaf solitary, blade erect or sub-erect, glabrous, oblong-lanceolate, 9 mm.—4½ cm. long, 3—9 mm. broad, narrowed below into a slender petiole 13 mm. to 16 cm. long, which is usually pubescent in the upper part and closely surrounded below by the sheathing remains of old leaves; peduncle erect, 4½—12½ cm. long; raceme ½—3½ cm long, 1—16 flrd.; bracts minute; pedicels distichous or spreading, the lower varying in length from 3—12 mm. in different inflorescences; perianth 5 mm. long; segments oblong, obtuse, white, with

brown or green keel; outer 4—5 mm. long, $1-1\frac{1}{2}$ mm. broad, inner $4-4\frac{1}{2}$ mm. long, 2 mm. broad; stamens almost as long as perianth lobes; filaments filiform; style about as long as the cylindrical ovary; capsule turbinate, flattened above, 3—4 mm. long; seeds small, with whitish hairs.

Stellenbosch Flats, frequent; flowering March—April.

This plant agrees closely in all essential features with Jacquin's figure and description though no specimens found thus far are as large as the one illustrated in Ic. t. 422.

According to Baker the species was collected by Drege in the Klein Drakenstein Mountains below 100 ft. and by Burchell between Stellenbosch and Bottelary Hill. No type specimen of the species was available for examination. Schlechter's 456, quoted by Baker as one of his type specimens of *E. cernuum*, appears to be a stunted form of this species, as do also a number of small specimens mounted on the same sheet and apparently collected in the same locality.

On the Stellenbosch Flats *E. parvifolium* occurs in rather clayey soil, often in the shelter of small bushes. While frequent in certain spots it never grows in the same abundance as *E. cernuum*, lacking as it does the copious vegetative reproduction of the latter species. The great majority of the specimens examined were provided with a single, apical growing point though a few cases have been noted in which a tuber showed two separate apical growing points each producing an inflorescence and leaf. (Pl. IV. fig. 2.)

The length of the petiole varies according to the position of the tuber in the soil. A specimen with an abnormally long petiole 16 cm. long was collected on the bank of the Karmelk Rivier between Union and du Toit Parks, while in the same situation a tuber which had evidently been washed out of the bank by flood water produced a petiole only 4 mm. long.

E. graminifolium, A. Duthie*; tuber small, pear-shaped, 8—20 mm. diam.; flesh of tuber whitish or very pale pink; growing point inserted at broader end; leaf solitary, produced after the flower; blade linear, closely veined, glabrous, somewhat coriaceous; more or less chan-

* For Latin descriptions of *E. graminifolium*, *E. confertum* var. *aureum* and *E. fasciculatum*, see Annals of the Bolus Herbarium.

nelled, $3\frac{1}{2}$ —15 cm. long, 1—3 mm. broad, narrowed at base into a slender petiole 4—8 cm. long, invested below by the fibrous remains of old leaves; peduncle slender, 5—18 cm long; raceme 1—10 flowered; 1— $5\frac{1}{2}$ cm. long, pedicels spreading, distichous or secund, the lower varying in length from $\frac{1}{2}$ —3 cm. in different inflorescences; bracts minute; perianth 4— $5\frac{1}{2}$ mm. long, lobes keeled with brown; the outer more or less reflexed the inner sub-erect; filaments lanceolate, shorter than the perianth lobes; style about as long as the globose ovary; mature capsule projecting beyond the dried remains of the perianth.

Stellenbosch Flats, in clayey soil, locally frequent; flowering in April. Herb. Univ. Stell.; Flora Reg. Stell. 1359.

E. spirale, Berg.; tuber small, globose, 4—12 mm. diam. with whitish flesh and apical growing point; foliage leaf solitary, produced after the flower, acicular, about $\frac{1}{2}$ mm. broad, the lamina in juvenile plants reaching the length of 4 cm.; peduncle very slender and spirally twisted, thickening abruptly immediately below the raceme; $4\frac{1}{2}$ —9 cm. long; raceme corymbose, 3—12—flowered; lower pedicels varying in length from 1—2 cm. in different inflorescences; glaucous, produced in one or more planes, bracts minute; perianth $3\frac{1}{2}$ —5 mm. long; segments oblong, sub-equal, the outer purplish below, the inner white with a purplish-brown keel; stamens shorter than the perianth lobes; filaments white, filiform or slightly flattened, anthers pale yellow, style about the same length as the oblong ovary; capsule about 3 mm. long, scarcely projecting beyond the dried perianth; seeds small with whitish hairs.

Stellenbosch Flats in clayey soil; locally common. Flowering April and May.

This species is represented in the Bolus Herbarium by Schlechter's 600, 'Kenilworth Racecourse' and 1388, 'near Wynberg.' Both of these are quoted by Baker in Flora Capensis 6: p.377. A third sheet, No. 13273, collected by F. and L. Bolus at Kalabas Kraal, May 1915, appear to belong to the same species. A pencil drawing made by Dr. H. Bolus from living specimens is preserved at the Bolus Herbarium. It agrees in all respects with the Stellenbosch plant as does also the written description on the back. Plate 2260 in Hooker's Icones Plantarum is evidently adapted from this unpublished sketch but it fails to

show the sudden thickening of the peduncle below the raceme which is so marked a character of this little species. This thickening is more striking in living than in dried specimens.

Eriospermum confertum, Baker, *var. aureum*, A. Duthie; tuber small, globose, 5—10 mm. in diam., flesh pale pink; growing point apical; leaf solitary, usually produced after the flower, lamina erect, acicular, $1\frac{1}{2}$ —4 cm. long, about $\frac{1}{2}$ mm. wide; glabrous; peduncle wiry, spirally twisted, 4—11 cm. long; raceme $\frac{1}{2}$ —3 cm. long; 2—8 flrd.; flrs. usually distichous; bracts minute; lower pedicels varying in length from 6—25 mm. in different inflorescences; unopened perianth cylindric, segments subequal, oblong, 4—5 mm. long, bright yellow above, the outer brownish green below, the inner with a distinct brown keel; stamens bright yellow, three-fifths to four-fifths as long as the perianth segments; filaments less than half a mm. broad; ovary cylindric, as long as or slightly longer than the style.

Stellenbosch Flats, frequent. Flowering in May. Herb. Univ. Stell., Flora Reg. Stell. 492.

Eriospermum fasciculatum, A. Duthie; tuber pear-shaped 1—45 mm. long 5—20 mm. broad, furnished with many long root-fibres; flesh whitish or pale pink; growing point lateral; leaf solitary, produced after the flower; petiole 2—9 cm. long, the upper part downy with many short horizontal hairs; lamina cordate-orbicular 2—5 mm. broad, furnished on the face with a fascicle of from 8—36 cylindrical, bristle-pointed processes which vary in length from 4—23 mm.; peduncle slender, 9—19 cm. long; raceme distichous or spreading, $\frac{1}{2}$ —4 cm. long, 3—13 flrd.; bracts minute, deltoid; lower pedicels varying in length from 2—12 mm. in different inflorescences; perianth segments white, keeled with brown or green; outer more or less spreading, 4—5 mm. long, $1-1\frac{1}{2}$ mm. broad; inner connivent, $3\frac{1}{2}$ —4 mm. long, $1\frac{1}{2}$ —2 mm. broad; filaments of outer stamens somewhat broader than inner; style half as long again as the green, globose ovary; capsule 5—6 mm long, 4 mm. broad; seed hairs white.

Stellenbosch Flats, in sandy soil; rare. Flr. March—April. Herb. Univ. Stell.; Flora Reg. Stell. 1356.

Two small leafy plants (No. 10569) in the Bolus Herbarium collected by Schlechter in the Bredasdorp District evidently

belong to this species. The leaf tubercles are densely hairy whereas those of the Stellenbosch specimens are usually glabrous or glabrescent.

This interesting little species is allied to *E. proliferum*, Baker, but differs from *E. proliferum* in the shape of the tuber, the hairiness of the petiole and the size and shape of the lamina. The first specimen collected was a leafing tuber found by Mr. C. D. B. Liebenberg, in April, 1923, not far from the Education Department. A number of specimens, both in flower and leaf, has been collected on the upper part of the flats during the present year. The tubers, which occur in sandy soil, often multiply by lobing and are covered with numerous, long, root-fibres. Specimens from which the leaves had been removed for drying were grown in clay soil in the garden and kept under observation. Several of these produced a second leaf towards the beginning of summer with a lamina of about normal size but with greatly reduced leaf tubercles. The smallest had eight tubercles very little longer than the lamina while another produced stunted tubercles which were conspicuously hairy.

Eriospermum sp. Two leafing tubers of this plant were found at the side of Hofmeyr Street in May 1923. They were growing in sandy soil close to typical *E. lanceaefolium*. Each tuber bore a single spatulate leaf with numerous elongated tubercles on the upper surface. One of these leaves and a tuber are figured in Plate IV. The leaves were removed and pressed and the tubers planted in the garden. A small leaf, with a lamina 2 cm. by 8 mm., was produced late in the season; the upper surface of this leaf bore slender, hair-like processes. Neither of the tubers has flowered this season but each has produced a small leaf with scarcely any trace of surface tubercles. It is possible that we have here a reduction in tubercles somewhat similar to that which has been found to occur in *E. tuberculatum* when grown under abnormal conditions. On the other hand the plants may prove to be abnormal specimens of *E. lanceaefolium*.

EXPLANATION OF ILLUSTRATIONS.

Plate I.—Figs. 1—5 *E. pubescens*.

- Fig. 1. Tuber, natural size.
- Fig. 2. Open flower seen from above.
- Fig. 3. Outer perianth lobe.
- Fig. 4. Inner perianth lobe and stamen.
- Fig. 5. Pistil.

Figs. 6—11 *E. lanceaefolium*.

- Fig. 6. Tuber with enlarged root-bases seen from broader end; natural size.
- Fig. 7. Outer perianth lobe.
- Fig. 8. Inner perianth lobe.
- Fig. 9. Three of the stamens.
- Fig. 10. Pistil.
- Fig. 11. Fruiting pedicel with displaced bract; natural size.
- Fig. 12. Dehiscent capsule.

Plate II.—1—6 *E. cernuum*, showing variation in leaf form and branching of tubers; natural size.

Plate III.—Figs. 1—7 *E. cernuum*.

- Figs. 1 and 2. Racemes in fruit; natural size.
- Fig. 3. Open flower seen from above.
- Fig. 4. Stamen.
- Fig. 5. Pistil.
- Fig. 6. Undehiscent capsule freed from persistent perianth.

Figs. 8—9 *E. spirale*.

- Fig. 8. Transverse section through pedicel.
- Fig. 9. Part of 8, more highly magnified.

Plate IV.—Figs. 1—7 *E. parvifolium*.

- Fig. 1. Entire plant with inflorescence and remains of old leaf; natural size.
- Fig. 2. Tuber with two growing points; natural size.
- Fig. 3. Outer perianth lobe.
- Fig. 4. Inner perianth lobe.
- Fig. 5. Stamen.
- Fig. 6. Pistil.

Fig. 7. Undehisced capsule.

Figs. 8—9. *Eriospermum* sp. with scattered leaf tubercles;
natural size.

Plate V.—Figs 1—6 *E. spirale*.

Fig. 1. Plant with inflorescence; natural size.

Fig. 2. Plant after shedding of fruits and development of
foliage leaf; natural size.

Fig. 3. Juvenile plant with foliage leaf; natural size.

Fig. 4. Perianth enclosing young fruit.

Fig. 5. Undehisced fruit.

Fig. 6. Dehisced fruit.

Figs. 7—14 *E. confertum* var. *aureum*.

Fig. 7. Inflorescence; natural size.

Fig. 8. Plant grown in shaded garden showing new inflores-
cence together with dried remains of last season's
inflorescence and leaf; natural size.

Figs. 9 and 10. Foliage leaves; natural size.

Fig. 11 Half open flower seen from the side.

Fig. 12. Open flower seen from above.

Fig. 13. Perianth segment with stamen.

Fig. 14. Pistil.

Plate VI.—Figs. 1—7 *E. fasciculatum*.

Fig. 1. Plant with few-flowered inflorescences and dried
remains of last season's foliage leaf; natural size.

Fig. 2. Foliage leaf with surface tubercles, seen from the
back.

Fig. 3. Flower seen from the side.

Fig. 4. Outer perianth lobe.

Fig. 5. Inner perianth lobe with stamen.

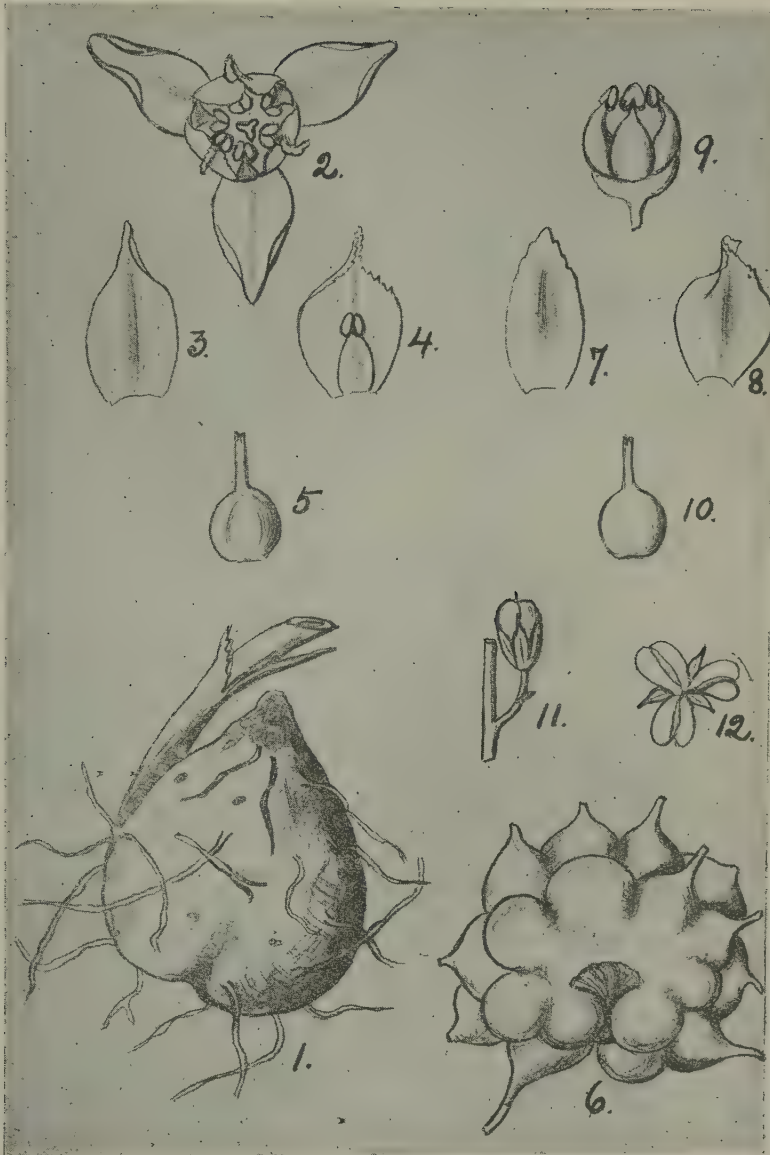
Figs. 6 and 7. Undehisced capsules.

Figs. 8—10 *E. graminifolium*.

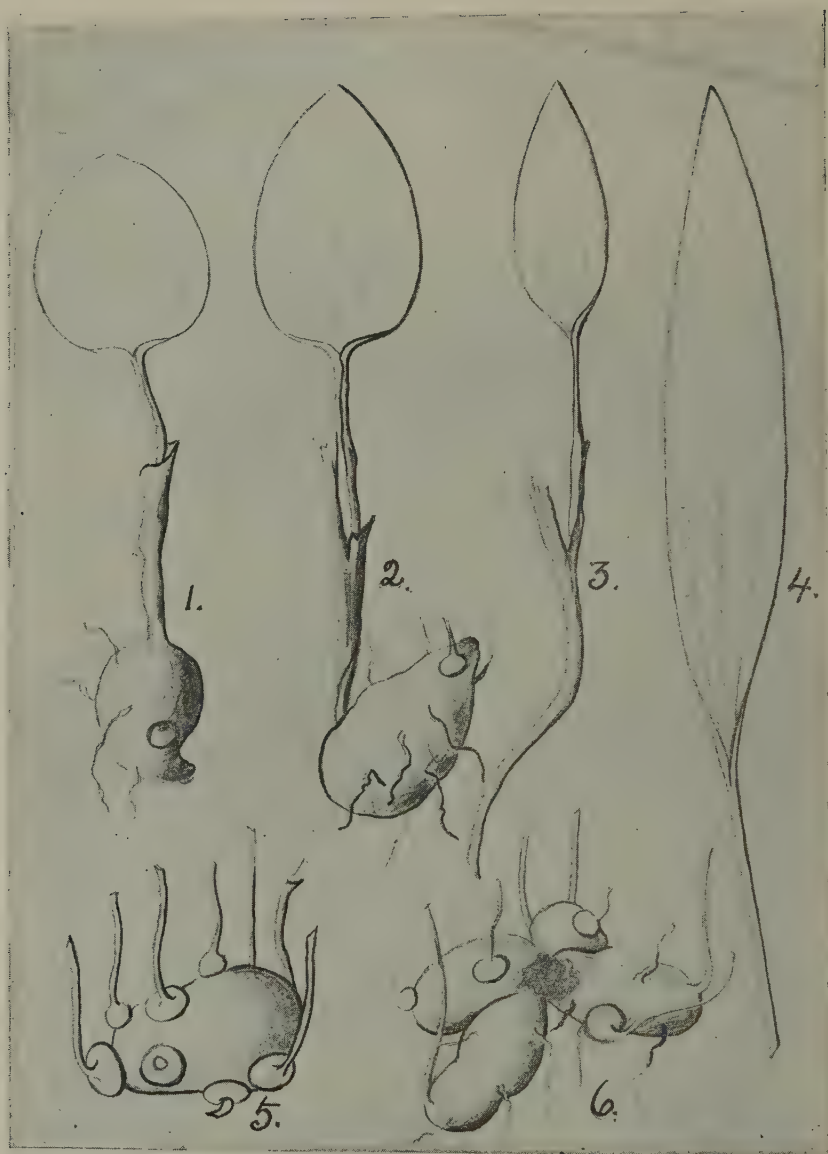
Figs. 8 and 9. Inflorescences; natural size.

Fig. 10. Foliage leaf with frayed remains of old leaf sheath;
natural size.

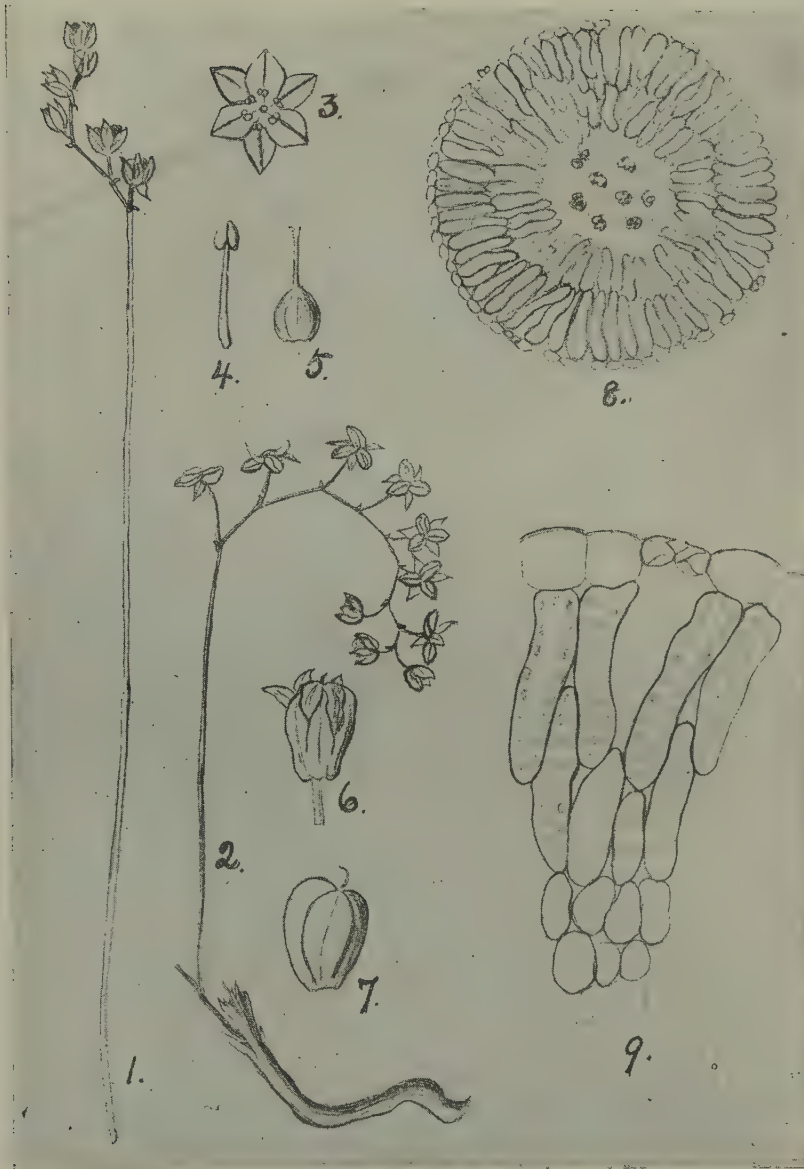
Pl. I.



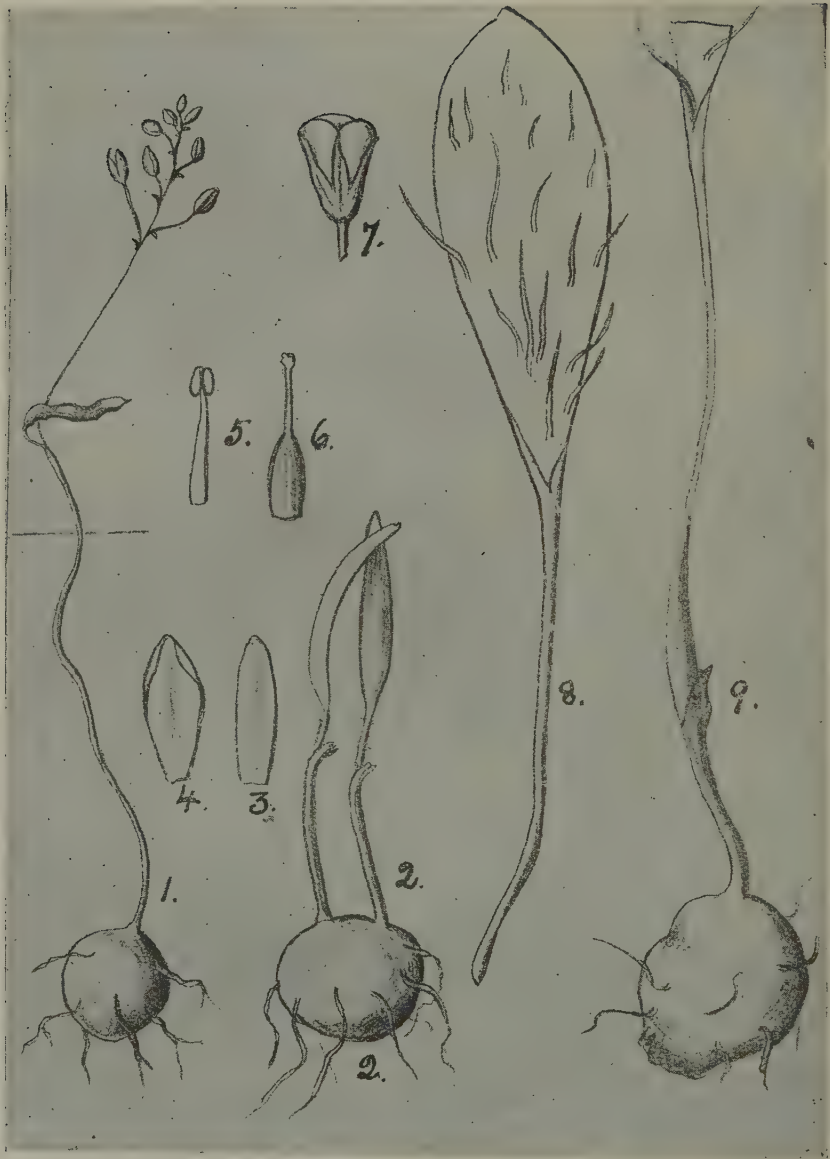
PL. II.

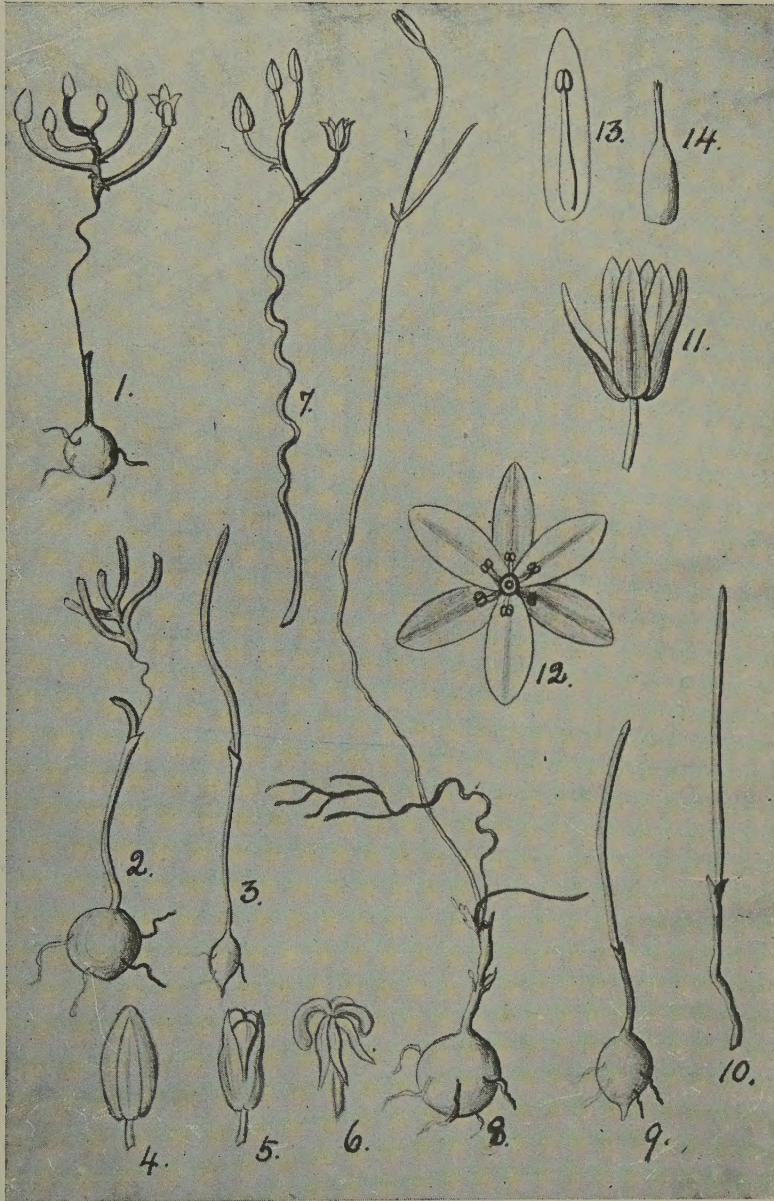


PL. III.



PL. IV.





PL. VI.

